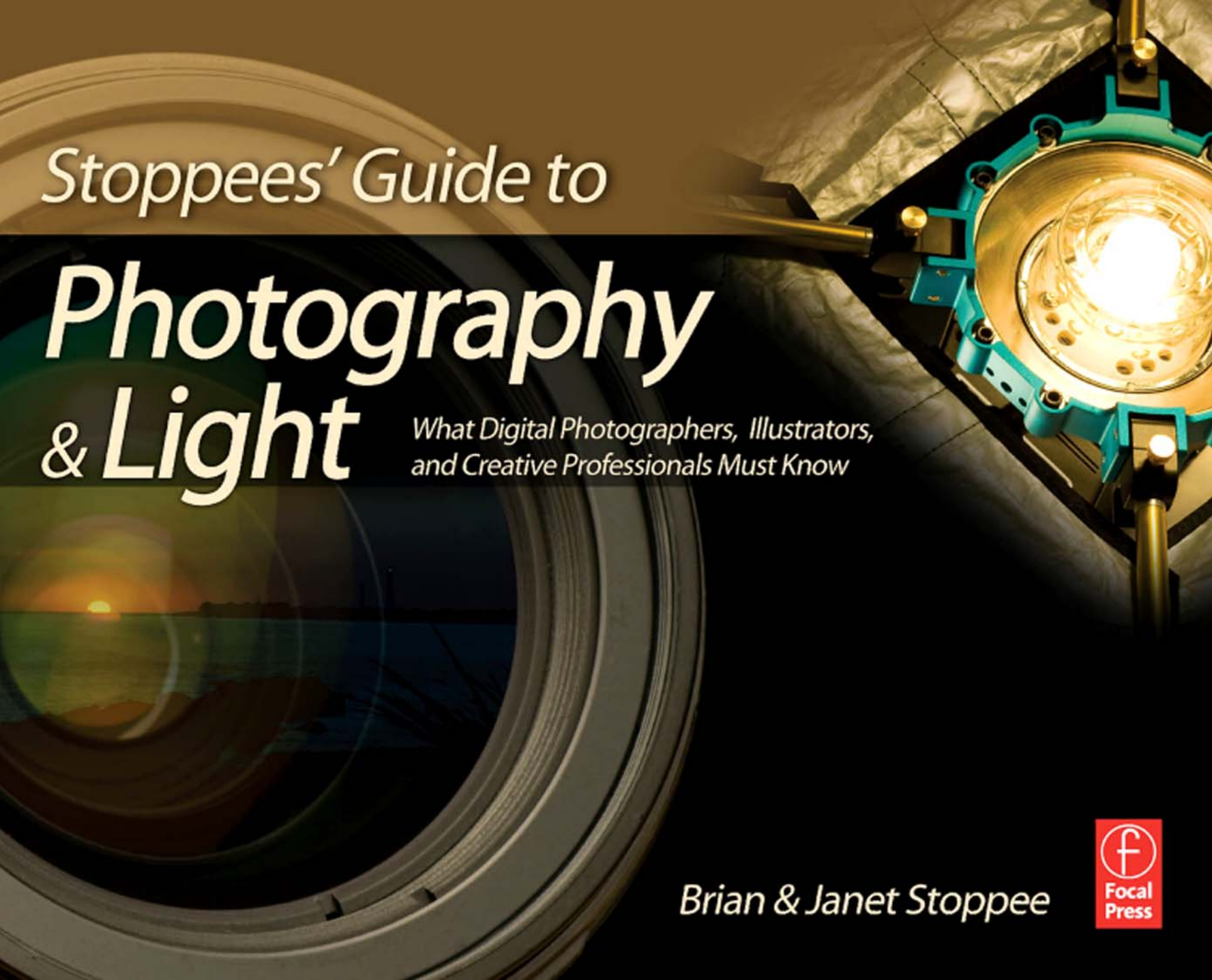




Stoppees' Guide to

Photography & Light

*What Digital Photographers, Illustrators,
and Creative Professionals Must Know*

Brian & Janet Stoppee



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Brian & Janet Stoppee

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Dedication

This volume is dedicated, in loving memory, to Brian's parents, Harry & Avalon, who have been personal and professional inspirations to Brian & Janet.

Harry, a self-made businessman, and Avalon, a graphic artist, wanted Brian to write books, since he was a child. They got Brian interested in photography, when he was eight years old. They whole-heartedly welcomed Janet into their lives, as a second daughter.

Avalon died a few weeks before this book's production completed. 🌸



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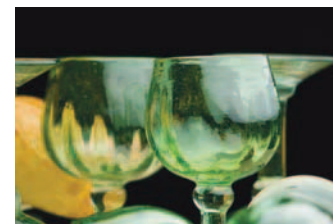
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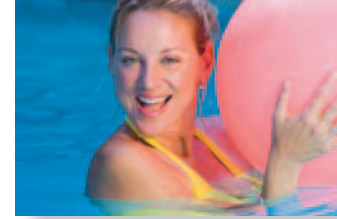
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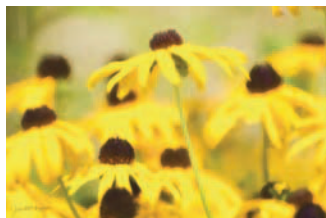
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The Color of Light

Light is the most positive energy we know. It reveals truth.

Most of the energy that light emits strikes a surface, bounces off, and then goes elsewhere.

Light is so essential that we cannot exist without it. Our lives depend on light as much as they do upon water.

Through photography, we capture for ourselves and share with others the glory of that positive, critical energy. Just like life, light brings us great joy.

Light comes in many colors.

As photographers, we are communicators of light. The images that we create enter the body through the eyes and travel to the brain, evoking a response.

Love the light, the energy, the joy, the color: communicate positively for the rest of your life. Celebrate and share every visual exploration. 🌸

A Colorful Day of Sunlight

At approximately, noon, on a clear day, we have a relatively even distribution of the sunlight's color wavelength.

Light and Air Molecules

Throughout the day, light must travel through air molecules. These molecules scatter a portion of the light's rays. As they scatter, the color of light changes.

Earlier and later in the day, light strikes the earth at an angle, and travels a greater distance. The light travels through hundreds more miles of air molecules in the early morning and late evening than it does at noon.

Dawn and Dusk Wavelengths

At dawn, some of the blue wavelength is absent. The air molecules have filtered out some of the wavelengths.

The opposite is true of the color of light after sunset. The sun's light is rich in blue, come evening.

At both dawn and dusk, depending on sky conditions, nature bathes subjects in light with an orange or peachy tone. Some photographers refer to these as the "golden hours." These windows of opportunity to photograph such tones are brief. Preproduction planning is a necessity. *(For more on wise planning, please see Chapter 5, "Preproduction Smarts").*

Throughout the day, the sun travels across the sky; the color of light changes. What we shoot at 7:30 a.m. will have a different color base than what we shoot at 12:30 p.m.

Communicating Time of Day

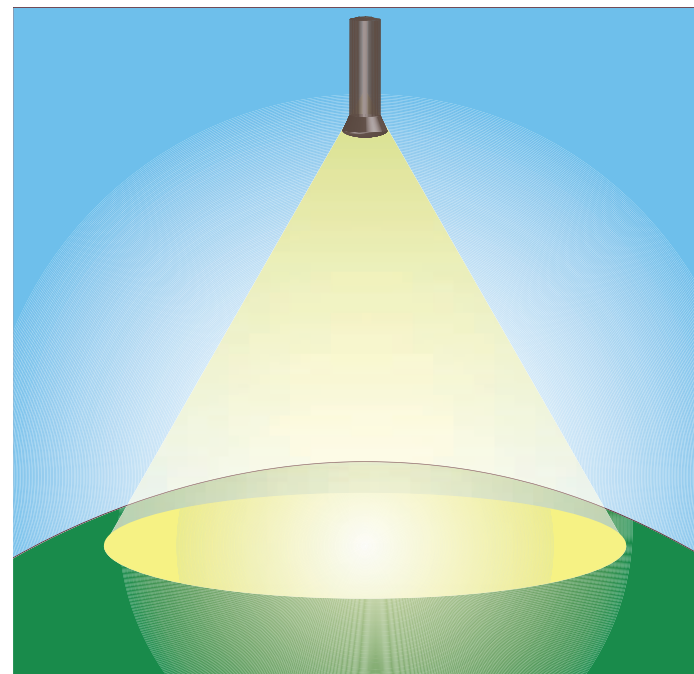
As photographers, we learn to use these colors to communicate the moods that are associated with these times of day. We use the time of day to create a different mood for what says "early morning" than what clearly conveys to our viewer the sense of what happens in the early afternoon.

Clean, neat children boarding the school bus works well with morning color tones.

Planning to Capture Color

Planning to capture color can mean that photographers and their crew need to be on location before the sun rises or striking the setup after dark.

Sometimes that sort of schedule is not an easy sell with assistants, stylists, and models. This schedule takes discipline. We make sure that our entire team sees every shoot as an exciting opportunity to capture what will only happen once. We make it fun, at all hours. Pacing our shoots is important, too.



Mid-Day Light

A ten-hour day, from setup to strike, maximizes everyone's energy. Be sure that everyone's energy remains up and it's a good time, for all.

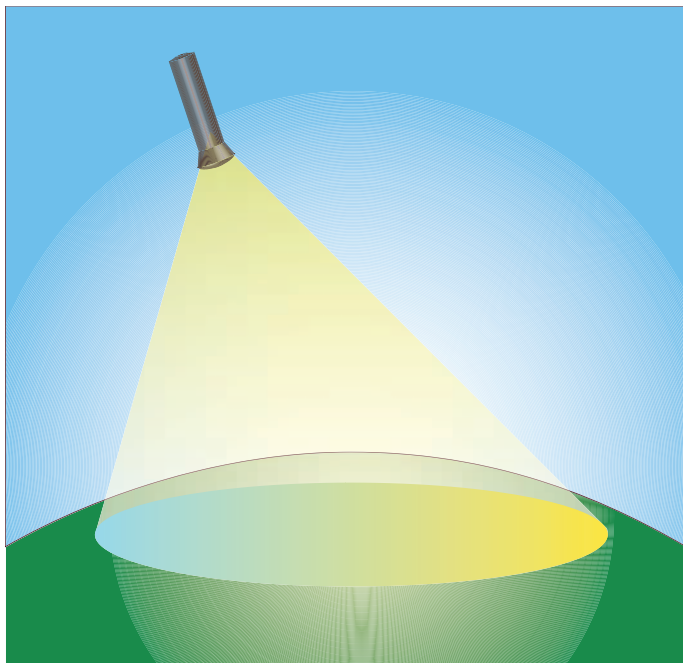
The Challenges of Light's Limited Intensity

As enjoyable and dramatic as the effects of dusk and dawn illumination can be, the lack

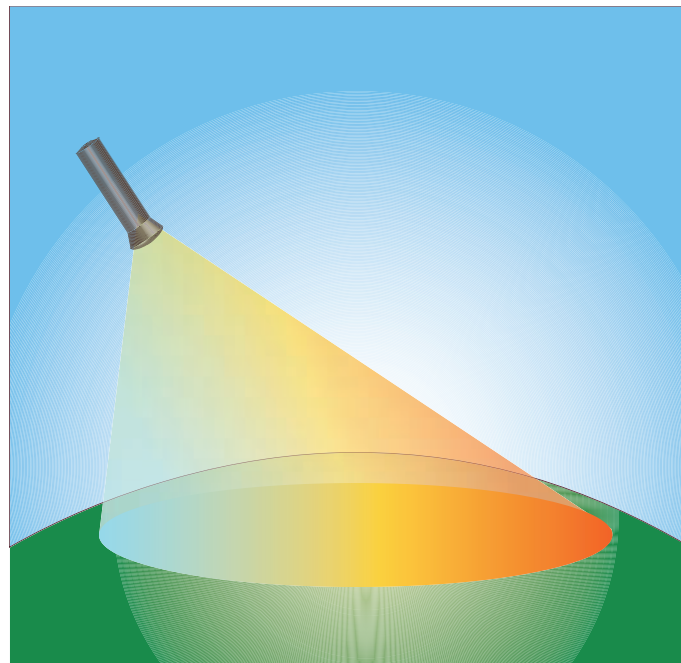
of that illumination's intensity creates exposure challenges. (Please see the start of Chapter 2, "Digital Exposure and Optics") Shutter speeds and aperture openings can present limitations, especially if we need to set the sensitivity of our cameras to 100, for maximum resolution and limited noise.

The further the light source is from our subject, the less intense the light becomes.

Sometimes in nature, we have no choice but to work with what we are given. Our philosophy is to enjoy what we have and make the most of it. 🌻



Late Afternoon Light



Late Evening Light

The Temperature of Light

Winter's cold. Summer's hot. If the thermometer says 20° Fahrenheit, we better bundle up. If the nurse sees that we have a body temperature of 100°F, we're running a fever. We are used to these common events and their associated temperatures.

At first, it's not easy for us to associate being able to measure light and express it with temperature.

There's a great deal of science to understanding light. This science requires precise tools of expression.

The Kelvin Scale

If we heat something enough, it will glow. Something that's totally black doesn't glow at all. It's at 0 on the Kelvin scale. This corresponds to something as unimaginably cold as -459.67°F.

Just as we express degrees Fahrenheit with F and Celsius with C, temperatures measured in kelvins are indicated by K.

We don't get a great deal of warmth when we light a match, yet without question, the match glows for a while. That glowing little match fits on the Kelvin scale at around 1,700 K. A basic household lamp burns at around 3,000 K.

The other end of the visible Kelvin scale can be related to a sky that is heavily overcast. Everything looks quite cool. That might have a light temperature of around 10,000 K.

Doesn't That Seem a Little Odd?

Something that we see as warm, on the Kelvin scale, is 1,700 K and something that's cold is 10,000 K?

When we establish, in our minds, some standard reference points (like the match and the household lamp), it eventually becomes second nature to us.

Noon Sunlight = 5,500 K

A great reference point is noon sunlight on a fabulously clear day. It measures at 5,500 K. Back in the days of film, that was considered "daylight." It's still our reference standard.

Five Basic Color Temperatures

For photographic purposes, there are five color temperatures to become familiar with:

Incandescent	3,000 K
Fluorescent	4,200 K
Daylight/Flash	5,500 K
Cloudy	6,000 K
Shade	8,000 K

These temperatures are approximations. Conditions in nature cause variations. Manufacturers specifications, plus the lifespan of the light source, cause these numbers to fluctuate, too.

Allow your mind to process the full visible spectrum of what is neutral, at 5,500 K, what is "warm," on one side, and what is "cool" on the other. With time, the Kelvin scale will



Kelvin temperature varies dramatically, based on the conditions of the environment in which the light is received.

become how your eye sees and how your brain processes the color of light. *(Please see pages 22 and 23 for more on how your eye and mind play a significant role in perceiving color.)*

The sun's surface is around 6,000 K.

When we heat iron, until it glows red, it's around 3,000 K. Once it glows so much that it becomes "white-hot," the iron, like the sun's surface is around 6,000 K. If the iron were to become so hot that it vaporized, the gas it gave off would appear blue. This would be way out on the Kelvin Scale at around 20,000 K.

Skylight?

The ambient light in an outdoor shooting environment is composed of two elements: the light from the sun, plus what the sky reflects back to the earth. These combine to create variations in color temperature. On a sunny day, the light coming from that blue dome above the earth is strong, but the direct rays of the sunlight are stronger.

The stronger the skylight, the more blue our images appear. This effect can show-up in some shadow details.

On a lightly overcast or hazy day, the sunlight and skylight combine for a color

temperature in the 7,000-8,000 K range. We can accept and enjoy this look or we can make some corrections.

Heavier overcast conditions at 10,000 K are not as easy to adjust. ☀



When considering the color of ambient light, there's more to it than what the sun delivers, directly. The sunlight that strikes the sky creates what can be

referred to as "skylight." The more strongly skylight exerts its influence on our images the greater the presence of blue.

The Year in Light

Because the earth orbits the sun on a tilted access, we have 365 more reasons to get out and capture images every day.

Light in the tropics is not as affected by seasonal changes. However, elsewhere on the planet, the angle of light goes through dramatic change.

Winter

In the colder months, not only do we have fewer minutes of daylight, but also our angle of light is low. We can capture some beautiful long shadows in the snow.

In Washington, DC, on December 21 the sun rises at 7:23 a.m. and sets at 4:50 p.m. This timing provides only 9 hours and 27 minutes of daylight.

Some think of winter as a bleak time to shoot outdoors. Yet the lack of leaves provide vistas that are otherwise unseen. Because of the longer shadows, some dramatic visual statements can be made.

Snow scenes provide high-contrast opportunities, because the white surroundings pop out the subject with fewer and/or less distinct foreground and background elements in the composition. The light that strikes the snow reflects back onto the subject. Illumination is more evenly distributed on some subjects.

Winter scenes can be quite serene and pastoral. They also can provide a few lighting challenges. Some cameras, in auto exposure modes, provide results that can be a half to a full stop darker than expected. *(For more on this please see Chapter 3, "Measuring Light and Color.")*

Spring

About thirteen weeks later, we have 166 more minutes of daylight, with the sun rising at 6:09 a.m. and setting at 6:22 p.m., for more than 12 hours of shooting time, and plenty of natural illumination to enjoy.

Spring's light in the northern hemisphere is influenced by the planet tilting more toward the sun. Shadows change as spring approaches. Monitoring the progress of the flora, coming out of dormancy allows the photographer to capture blooms at their fullest, on the perfect day with the best illumination and finest weather.

Summer

By June 21, the sun rises at 4:43 a.m. and doesn't set until 7:37 p.m. With 14 hours and 54 minutes of well-illuminated shooting time, plus those extra dramatic minutes before and after, we can knock ourselves out with a potentially exhausting 15-hour work day.

With the earth now at the closest to the sun, at the summer solstice, some consider the light of this season to be best for colorful, well-saturated images, often with shorter shadow length, as the sun is at its highest point. At this time of year, the sun is directly overhead at the equator at noon.

Some find this time of day over the summer to be a bit harsh. Under hot and humid conditions, talent and the rest of the crew are not always at their most productive.

Good sunscreens are essential throughout the year, as is proper fluid intake. For summer shoots, keeping everyone safe from UV exposure and dehydration is critical.

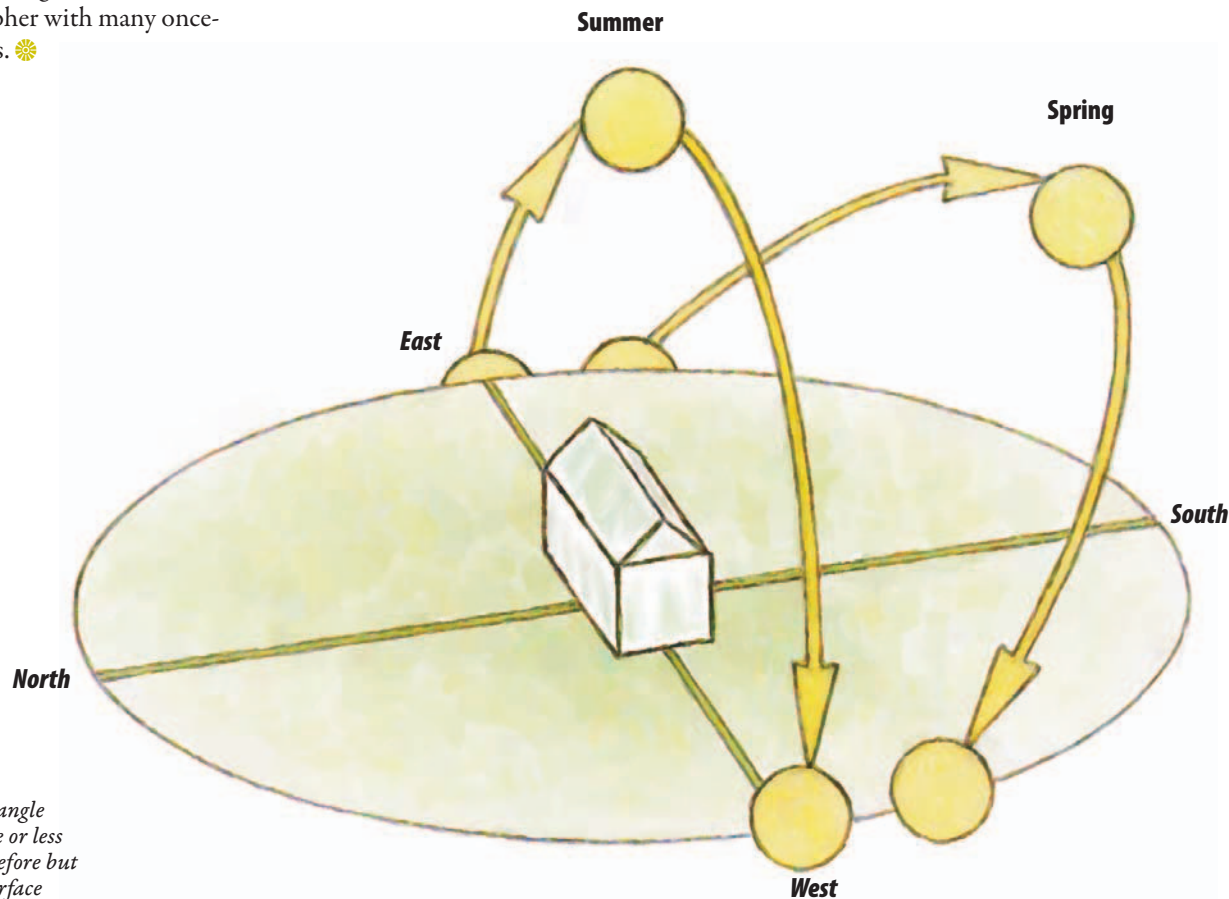
Always plan a shoot responsibly.

Fall

By the autumnal equinox we are back to around 12 hours of daylight with sunrise at 5:55 a.m. and sunset at 6:06 p.m., Yet these 731 minutes of light offer some spectacular color as the chroma of leaves that the eye perceives as green now reveal their hidden brilliant tones and hues that the diminishing light, precipitation, and temperatures coax out of them for our photographic bliss.

Summer's more harsh moments diminish, as the sun's angle is no longer at 60° above the horizon in most of the northern hemisphere.

As with the spring, monitoring nature's conditions provides a photographer with many once-in-a-lifetime opportunities. 🌻



Throughout the year the sun's angle changes. Not only is there more or less light every day than the day before but the angle of light, striking a surface has changed, as well.

Light's Direction

When shooting expansive scenic images, the photographer is at the mercy of the sun's position, for the direction of light.

Of course, when photographing smaller scenes outdoors, we have many light modification options. *(Please see Chapter 8, "Man-Made Modifiers," for more on this.)*

The angle of light creates a visual statement that can be part of a photographer's style signature. Having an eye for using the light to your advantage changes what an image communicates to the viewer. Because the angle of illumination is much like taking a light source and making a trip around the globe with it, the possibilities seem infinite.

Nature's Direction

For the majority of the day, natural illumination comes from above, so any departure from that creates a unique image. Outdoor objects facing east are front-lit in the morning and backlit in the afternoon.

When shooting outdoors, scout your site whenever possible, so that you can plan for the best light on your shot list's schedule. *(Please see Chapter 5, "Preproduction Smarts," for more on this.)*

Five Angles of Light

To assist you in pondering your options for light, we'll narrow them down.

1. Frontal

To some, frontal illumination is too flat and at other times it feels harsh. However, its benefits include few visible shadows. It hides many imperfections and, if soft enough, can be somewhat flattering. It goes along with the old rule that photographers should stand with the sun behind them. Often the meter in a camera is a safe bet for this sort of light. Front lighting often accentuates color. When photographing people, if the frontal light source is too strong, the subject might squint.

2. Overhead

Some photographers have given overhead illumination a bad name, too, because it does not have the drama that other angles of light provide. However, some situations work well when the area is simply well-lit and other visual elements, such as the subject or the optics make their own statement. Modifiers help to lessen harsh shadows.

3. Side

There's a great deal of drama in sidelighting. It's often characterized by distinctive shadows and highlights. The hidden details in the shadows create a sense of mystery. If one side is well-illuminated and the opposite side is not, the subject has a very three-dimensional feeling to it.

4. Rim

When the primary light source creates a highlight on the edge of the subject, a dramatic rim light effect rivets attention to the main event, in the photo. This approach can allow the subject to go dark, or the rim light can be the most powerful of various sources of illumination. Rim light can also be known as hair light.

5. Backlight

Silhouettes are not the only use of backlight. This dramatic lighting vehicle tends to pop out the subject's shape. When used with other light sources, backlight gives the subject a very three-dimensional quality. Some of the subject's texture and detail are lost, which may be exactly what you want. ☀

Don't just look at your subject, study it. Envision how light will affect how the subject would be rendered differently if the light moved from here to there. Consider the possibilities and draw yourself a mental picture.



What Your Eye Sees

Our eyes are much like a camera. There's a lens. We have a pupil, which works like an aperture, automatically adjusting how much light is allowed into the eyeball.

Our Retina - The Photographic Film of the Eye

There's also the magical light-sensitive inner layer that works like photographic film: the retina. It receives the images formed by the lens and transmits them to the brain through the optic nerve. In an outer layer of the back of the brain lies the occipital lobe. That's where we process the color information that our retina hands off, along with visual tasks and motion perception.

The retina has rod cells that are highly sensitive to light, but not to color. The rods respond even in very dim light or darkness.

Our retinas have a contrast ratio at any time equal to around $6\frac{1}{2}$ f-stops. However, as our rod cells are able to adjust so well, we have an amazing dynamic range of about twenty f-stops.

Though we have two eyes, which work independently of each other. Together, the brain uses them to assist our dimension perception.

Much like in a camera, the image that the retina sees is upside-down and reversed. Our indispensable brains correct this, too.

Trichromatic Color Vision

Along with the retina's rods, we have cone cells, which allow us to perceive color. These photo-sensitive cones are receptive to short, medium, and long wavelengths of light. We refer to the cone that receives the long wavelengths as the red receptor, because it is responsible for the perception of red. However, its peak sensitivity is in the greenish-yellow region of the spectrum. The medium and short wavelength cones are not necessarily blue and green, either, even though they are often described that way. We use the RGB color model to represent how the cones of the human eye work. We call this trichromatic color vision.

Relating the colors that the cones of our retina communicate to just red, green, and blue is deceptive. Those three primary colors blend to form a vast color model.

Color Perception

We perceive color based on the wavelengths that are reflected off the subject that we see.



This is what a green pepper looks like under 3,200 Kelvin lighting conditions.



Here's what your brain tells you that it looks like, having adjusted it by 2,300 K.

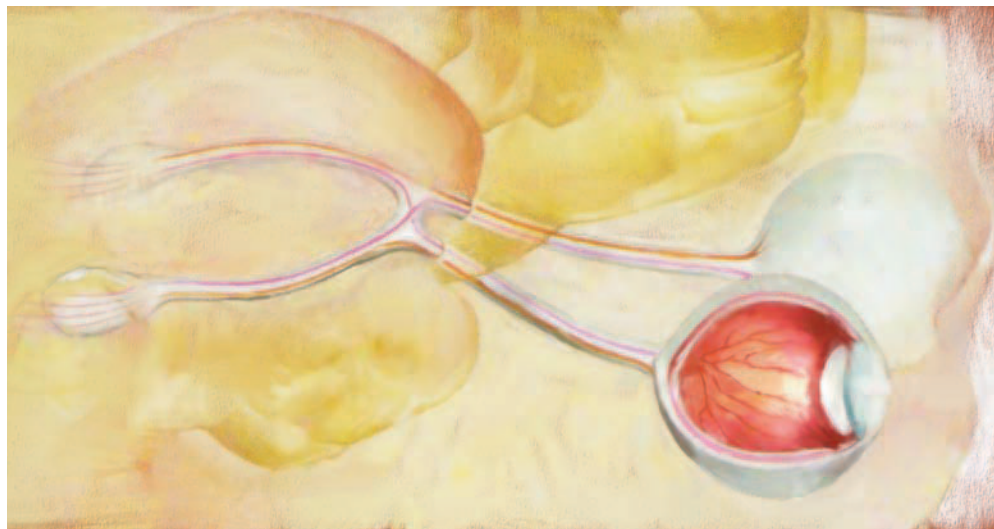
How Your Brain Compensates

We might think that a red dress emits red light, but the dress absorbs all wavelengths except the red ones and then reflects the red wavelength. We know that the dress is red only because we are able to distinguish those wavelengths. Some mammals are able to see a greater spectrum than humans and other mammals have no color perception at all.

Chromatic Adaptation

Once the image has been conveyed to the brain from the retina, the brain goes to work making color compensations for what information has been handed to it. We perceive that certain objects should be certain colors. A green pepper should always be green, whether we see it in daylight, under incandescent illumination, or during a cloudy day. *(Please see pages 16 & 17 to further understand the color of light.)*

Your digital camera's sensor makes no such adjustment. It reads the green pepper based on the quality of light that is falling on it. This optical illusion that our brains play is called "chromatic adaptation," sometimes known as "color constancy." As photographers, we need to think as our image capture systems think



(or don't think). We cannot let our chromatic adaptation tell us that what our cameras will capture will match what our brains are correcting. We have to rely instead on the sophisticated instruments in our finer cameras and color meters *(examined in Chapters 2 and 3)*.

The Lubricated Eye

Do you want to see with greater clarity? Keep your eyes well lubricated. It makes a difference. Always have eye drops at a shoot. 🌸

The retina of your eye is its film. It relays the images to the brain for processing. The brain is much like Adobe Camera Raw in Twin Turbo mode. It makes the color corrections, creating pleasing scenes even when the light makes them less than fabulous.

Color's Palette

In his early twenties, Isaac Newton explored the behavior of sunlight through glass prisms. To this day, we too are fascinated by how seemingly pure light enters one side of a triangular block of glass and the colors of the rainbow emerge from the other side.

Not only did Newton see the prism break light into rays of red, orange, yellow, green, blue, indigo, and violet, but the colors blended without seams.

Though that was the year 1666, and this is the twenty-first century, we must explore with the same sort of gusto as did Isaac Newton. We must have a daily, lifelong fascination with light and color.

Color Theory Then and Now

Tradition color theory is concerned with mixing the paint that went on canvases.

Today we have to apply color theory to digital color management.

We now create in the additive color world of the red, green, and blue primary colors. It's now all about how our liquid crystal displays translate pixels into color displays for our computers and camera backs, rather than oil

paint for canvas. To make it more challenging, when we print our work, the RGB image is translated into four to nine inks based on the cyan, magenta, yellow, and black (CMYK) color model, familiar to large printing presses. (For more on color models, please see Chapter 4, "Light, Color, and Use").

Communicating Color

Traditionally, the photographer's discussion of color was limited to "a warm scene" or "cool light." Obviously, reds, pinks, oranges, and yellows commonly say "warm," and blue and green signal "cool."

With all the visual tools available to us, today's photographer has even more reason to become a significant visual communicator.

Many successful photographers have mastered the technical aspects of the medium. Some of those who really shine at photography not only have a well-trained creative eye, but are able to articulate visual principles to create a collaborative environment with everyone involved in a project.

Sun's Palette

One aspect of understanding light is the relationship that colors have with each other.

Sunlight has a remarkable assortment of visible levels of warmth and coldness over

the course of a day. (Please see pages 14 & 15 for more on this.) Choose a single outdoor scene and revisit it throughout the day. Be there at daybreak, when the sun is not yet above the horizon. Don't just capture this with your camera, but also determine how you will communicate what you see to others. Are there muted blues? What is unique about greens in the grass and trees? Does the coolness of the scene cause you to describe the blues and greens as "exaggerated"? Would you call the earth tones "blue and subdued"?

Next, return to the same spot at noon. On a clear day, the sunlight is made up of roughly equal amounts of warm and cool colors. How would you describe the color of the same subjects? What has a fairly neutral color balance?

Finally, go back there just before sunset. Capture and describe what you see. Do warm colors now predominate? With what colors has the sun washed the scene? What's glowing? Are there rays of yellow, red, and gold that you would term as, "romantic"?

For the most part, the physical elements of the scene have not changed. The subjects have the same qualities 24/7. What has changed is the quality of the ambient light. This change should have altered your perception of the landscape. With a keen sense of what has evolved over the course of twelve to sixteen

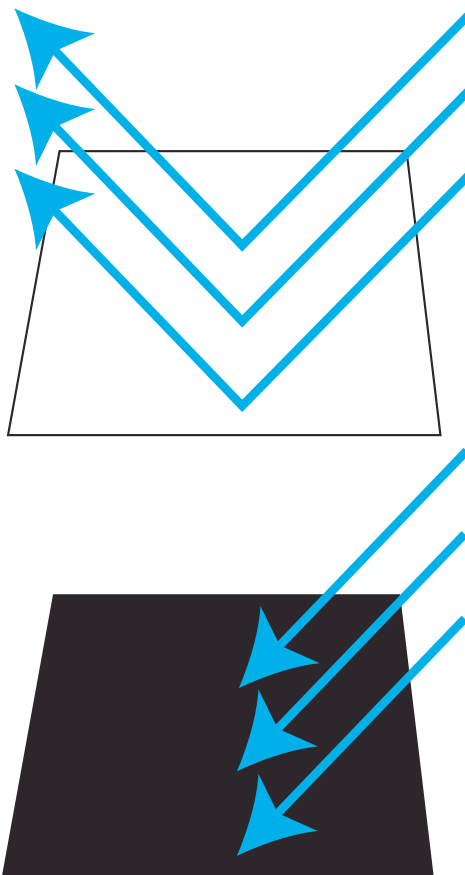


Neutral Density Gray

hours, this should have evoked an emotional response from you. Chances are that you have had many years behind the camera, maybe even going back to your childhood. You have seen many of your own photographic images and you have surely been studying the images of others. How well can you articulate what you are experiencing? This project in communication involves more than your ability to talk about photography. More importantly, it forces you to carefully examine what you are seeing.

Many experienced photographers may have a visual awareness of the palette of hues to be found in daylight. They may bring back some great images. They may also find themselves using color well to create remarkable photographic images, almost without thinking about it.

For photographers to reach their full potential, they need to carefully examine not only the images that they are creating, but also the experiences that are streaming into their eyes. By forcing themselves to explore and express these experiences, photographers grow and become who they are meant to be. 🌸



The majority of the light that strikes a white card is reflected, and a black card absorbs just about all the light that comes its way.

Being average is not the aspiration of any diligent creative soul. Yet understanding what average is all about is key to the technical side of using light to our greatest advantage.

We can distill all of life's most beautiful visuals to an average value of 18% gray. This is known as neutral density. Of the light that falls on most subjects, 18% is reflected.

A basic camera's built-in meter depends on neutral density to deliver acceptable results in average automatic exposure situations. *(For more on use of a gray card in exposure, please see Chapter 3, "Measuring Light and Color.")*

A bright white surface absorbs only 10% of the light energy that falls upon it, reflecting 90%. A dense black surface absorbs the majority of the light, reflecting very little.

Keeping these principles of reflection in mind is key to understanding not only exposure, but also the quality of light that we capture.

Knowing what is average assists us in creating what is unique. 🌸

Minimum Density: Super White

Testing to be certain that film processing is up to specification is essential before the customers' precious images are sent through the chemical baths. The same is true of keeping the photographic paper processing accurate.

D-Min and D-Max: Total Contrast

An essential tool in the photo lab business is the densitometer. "Densitometry" measures the optical density of light sensitive materials. "D-Min" and "D-Max" refer to the minimum and maximum density that can be recorded on the material.

If it's film, D-Min is relatively clear. In the case of paper, D-Min is white. On the other side of the tonal spectrum D-Max is as black as it can get. These are total contrast values.

Photographing Absence

We can make dramatic visual statements by what we photograph, but not as much as by what we do not capture in an image. A subject surrounded by light rivets our attention on just the subject. All of the background and foreground goings-on are absent. Our attention is fully drawn to the subject. The stark qualities of super white give us nothing else to see. *(Please also see the section "High-Key" later in this chapter on pages 50 & 51.)* 🌸



Maximum Density: Blackest Black

The mystery of total darkness is both intriguing and at sometimes frightening. There is so much that is hidden in the blackness. Yet, like a central subject immediately surrounded by super white, with black all around the outside edge of the image, our attention is driven strictly to the central visual message.

The simplicity of the black causes the subject to jump out of the image. There's nothing else for us to see. A model on black looking into the camera's lens appears bold and unafraid. The same talent, looking away from the camera with a less self-assured appearance, can evoke natural feelings of concern for the subject from the viewer.

For product photography, a black surround may cause the viewer to want to know more. The blackness is an excellent convention to tease and entice, at the risk of appearing less than forthright. If not done correctly, the audience could wonder, "What aren't they telling me?"

Much like those who would prefer to be a few pounds thinner, and therefore wear black seemingly 365 days a year, photographing someone on black with limited illumination can hide many sins. *(Please also see "Low-Key" later in this chapter on pages 52 & 53.)* 🌸



Angles of Incidence and Reflection

Frustration plagues photographers who are faced with unwanted reflections. It becomes even more exasperating when one is trying to create an even reflection on a subject and is unable to achieve the desired effect.

The Angle of Incidence

Learning a few basic principles of physics can relieve many of these photographic annoyances. Consider it fundamental to understand some of these technical aspects of photography. The more fully you comprehend these sorts of things, the more prolific you will become at image-making.

Any ray of light that strikes a surface is said to be “incident.” The angle of incidence is then the angle of that light ray.

The Angle of Reflectance

If the incident light strikes the surface at 45° to the camera's axis, it will reflect that light at an equal and opposite angle, -45° . The principles are that simple.

It's just as easy to put this into practice. When photographing a city building with plenty of glass windows, you see reflections of the buildings across the street. If you are looking directly at the building, you may even



What's Seen... What's Hidden

see a reflection of yourself about to make the photograph. Move down the sidewalk a few yards. Now the reflected subject material will have changed. Try the same thing, moving even further down the sidewalk, but in the opposite direction. As you move, so the reflections change.

Next, try photographing the hood of a dark car on a crisp day. Notice how the sky is reflected in the hood. As you move about the car, you see different reflections of the sky.

In both of these situations, you witnessed how the angle of incoming light varied, as you changed your camera angle.

This angle becomes significant in work with artificial illumination, especially in dealing with shiny surfaces. Sometimes the reflection of your light source in the subject becomes a significant part of the image's success. In this situation, you are able to move the light source to accommodate your vision.

In each example, some of the reflections are seen and some are hidden. It's your choice.

Commit this to memory: "Angle of Incidence = Angle of Reflectance."

Another excellent example is copying artwork that is both textured and glossy. (Please see the section "Copying Flat Art" in Chapter 13, "Digital Studio Flash," pages 396 & 397 for further information.) 🌸



When working with artificial illumination, the lighting instruments create reflections of themselves. This can become especially perplexing when shooting multi-faceted crystal. Keeping in mind how the angle of incidence equals the angle of reflectance will assist you in solving challenges.

Reflections

Is it really “all done with mirrors”? Well, in a sense, yes! The only reason we see anything is because energy that is not absorbed by a subject is reflected.

The more polished and glossy a surface is, the more the image includes reflections.

This knowledge should rev your creative engines. The possibilities are endless for the great reflected objects that you can find.

Patterns in Nature

Some natural events create beautiful patterns, such as raindrops falling in a puddle. Other great images are created on rain-soaked pavements both during the day and at night.

Nature's Mirrors

Some wonderful, graphic images can be found in nature where one object is the direct reflection of another. A great example is a swan on a lake. We see both the swan and the swan's reflection. Try skipping the swan and see what a kind of a story you can tell with just the reflection of the swan.

Cityscapes

A never-ending array of images can be captured and tell the story of city life. A building with highly reflective glass is a gem of a find. Images of people on the go, as seen by their

reflection, create an abstract sense of fast-paced life. Sometimes the static quality of the huge edifice forms an intriguing contrast to the blurred action in the reflections.

Children

There are touching photographic tales to be told of a child's joyful face in a window, where Santa can be seen indoors, or a happy youngster captured in the reflection of a sparkling Christmas ornament.

Memories in Mirrors

Some fabulous unforgettable moments can be seen through the images of mirrors, such as a mother and her daughter on her wedding day, as they get ready, together. The same is true of a father with his young son, as seen in the mirror of a barbershop during his first haircut.

Abstract Elements

Other rewarding finds are reflective surfaces that form abstract shapes and create undefined images. Water in gentle motion creates mysterious photos. The windows of a bus or train as it's pulling away depict energy that's happening, as do the reflective surfaces of an airport terminal.

Keep your eyes open. Let your imagination explore. 🌸





Surfaces and Textures Everywhere

Whether you're photographing an object or a human face, there are surfaces and textures everywhere. They are all absorbing and reflecting light. Understanding how to make the most of them, so that your visual voice says exactly what you want to be heard, must be high on your priority list.

Observe Light's Effects on Textures

Before you go any further in your discovery process of what textures do to the light that strikes them, ferret out a few images that feature textures. Concentrate on those that impress you with how the light makes a special statement about the texture.

What Is Texture?

Ponder that question for a bit. Your first impression of texture could be something like weathered wood or well-worn burlap. An impressive photographic texture is also a baby's cheek or highly polished gold.

The most successful photographic renditions of texture are the ones that cause you to believe you can almost feel the surface, right on your fingertips.

In other cases, a photographer has done an excellent job if we cannot see much of the texture at all.

The Skin's Textures

Portraits of elderly, hardworking fishermen aside, photographers are often expected to photograph people with all the flattering light possible. All clues to a person's age can be revealed through texture.

From the day we are born, gravity takes over, along with all the other natural elements. It's seen in our wrinkles; it's in our pores, no matter how well we take care of ourselves. We have our nicks and dings.

As photographers, we celebrate a face. We have the fabulous opportunity to make someone feel great about themselves. Our images allow another person to cherish the picture of a loved one next year, next decade, next century.

We are storytellers.

Softer light can both hide texture, as it wraps around the imperfections, providing smoother transitions from highlights to shadows, or it can bring out shadow details that harder light can hide.

Texture and Color

There's a great story to be told about color and texture. Yet sometimes the story is best told in black and white.

In well-illuminated conditions, textures come off the page. This is due in part to the higher contrast. It can make some color situations quite aggressive. On other occasions, an absence of color makes a far greater statement. It focuses the viewer's attention on the raw texture in the image.

Light's Angle Accentuates Texture

Play with the angle of light on a surface. The lower the angle, across a surface, the more shadows are created. As we create more shadows, the texture becomes all the more obvious. If it is our goal to make the texture scream, we need to accentuate that angle. However, if we're covering imperfections we need to softly flood the subject with light.

Surface Reflections

Light strikes a smooth surface and cleanly bounces off, like a fast ball, swiftly moving on its way. All the light that strikes the entire surface moves in concert.

On surfaces that are more textured than smooth, light hangs around for a while and knocks about from here to there.

Direct Reflection

A smooth, glossy, flat surface sends light in one direct reflection. If all the light comes in from one direction, it travels off in one direction, too, like a very precise marching band. If the surface is polished enough, the light creates a hot spot.

Specular Reflection

Some glossy surfaces that are not flat scatter their reflection over the shape of the surface. Though the light may come in evenly, it is reflected based on the shape of the subject.

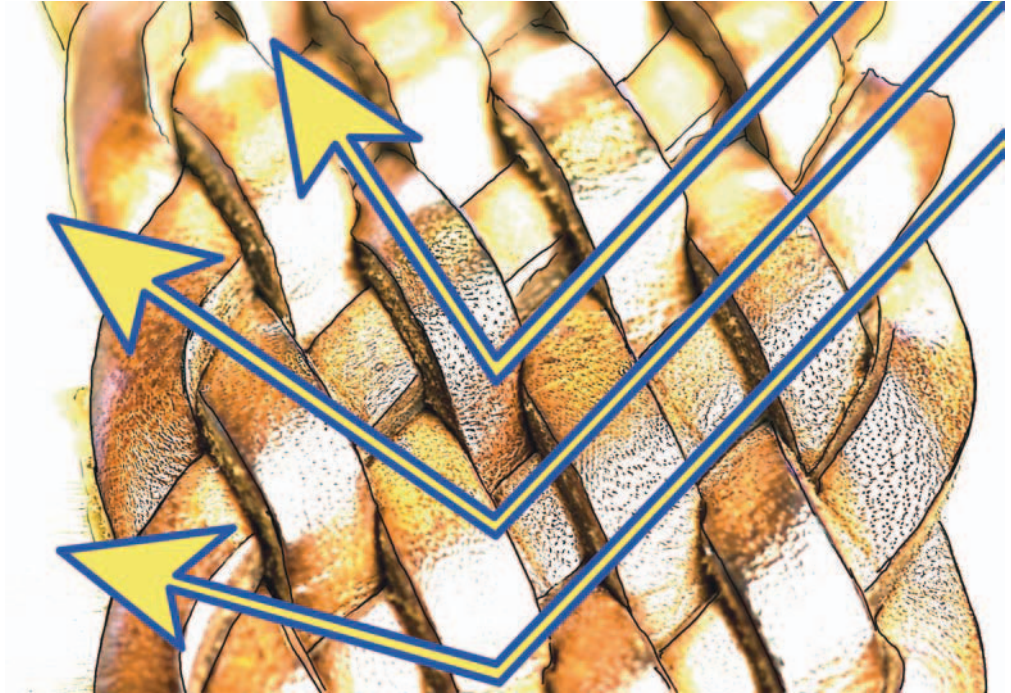
Understand Speculars

The photographic term “specular” means mirror-like.

To see it in action, look in a mirror, in a well-lit space, while adjusting the angle of a hand-held mirror, under your face. You’ll see little hot spots move across your face, as the mirror catches light and reflects it back. That hot spot is an instance of specularity.

Diffuse Reflection

When rays of light strike a course-textured surface, they scatter all over the place, depending on how rough the surface is. The more faceted the surface, the broader and more varied the diffused reflection. ❁



A uniform, single-directional light that strikes a textured surface, scatters in many directions. This behavior is unlike that of a smooth surface, which reflects light in an even manner. A textured reflector produces softer light.

Plenty of Highlights

Highlights make or break a photo. It's all about pushing the drama to the limit, but not crossing over the line. As the name implies, highlights should provide visual excitement.

Too Hot?

Some of what passes as excellent to you, as a photographer, might not be all that acceptable to someone else. Fortunately, it's all a matter of personal judgment when you're shooting for your own pleasure.

When you're working in a commercial environment, though, there are some rules to follow.

Highlights can become too "hot." We can define "hot" as an absence of detail. Obviously, the highlights on a white object are going to be white. If the highlights on skin tone are white, the image is considered to be overexposed.

Diffused Highlight

Every image has a neutral zone. It's the portion of the image where the exposure is perfect for the intended use. You meter for that space on your subject. (*Please see Chapter 3, "Measuring Light and Color" for more on this.*)

In a head shot, a fair amount of the face is usually in that neutral territory. We call this a "diffused highlight." Finding the diffused highlight is the key to preferred exposure.

Some of this is technical and the rest is built into your creative mind. When you envision how to photographically portray a subject, ask yourself where the neutral territory is? How broadly spread is the diffused highlight on the subject?

Specular Highlight

The hottest spot on a subject is your specular highlight. Of course, some subjects, like the human form, have many contours, so there can easily be more than one specular highlight. However, keep compositional elements in mind, as too many specular highlights can easily distract the eye.

The specular highlight is an attention-getter. Your viewer's eye will automatically make it a central focal point.

Imagine a woman in a low-cut dress, lit from overhead. If the specular highlight is on her cleavage, that's where the viewers' eyes are going to focus, especially if she is not looking directly into the lens. (Though your subject

is two-dimensional and frozen in time, the normal human reaction is to stare more at someone who is not making eye contact with the audience.)

Specular Form

Give some thought to the shape that the specular highlight creates on your subject. It says a great deal about the rest of the image.

If you are photographing a grouping of balls on a billiard table, do the specular highlights take a round form, as if there is a globe-shaped lamp above them? Are these hot spots rectangular, as if the table is near a window? If lit artificially, do the specular highlights mimic natural conditions?

Specular Edge

Some specular highlights will have a harder quality to them than others. Soft or hard, the "specular edge" is defined as that transition space between the specular highlight and the neutral area that is known as specular diffusion. An extremely soft specular edge does not draw too much attention to the highlight. The hard specular edge makes a louder statement about the lighting conditions. 🌸



Plenty of Shadows

Shadows are the companions to highlights, when we are talking about the resulting light quality of a subject. Without shadows, diffused highlights would have limited form.

Umbra and Penumbra

There are shadows that fall in the opposite direction of a light source. Like a lunar eclipse, these shadows cast an “umbra” from an opaque object, where the shadow is the darkest. With it is a “penumbra,” a partially shaded region, as the shadow transitions out. Some of these shadows are short and others can be quite long. Crafty photographers find ways to prevent very little of these shadows from being seen.

A Subject’s Shadowy Side

For now, our primary interest is the shadowy effect on one or more sides of a subject. These shadows are, in essence, the opposite of a highlight. They literally round out the subject and convey a sense of three-dimensional qualities. It’s tough to have a highlight on a three-dimensional subject under a single light source, without having a shadow.

Shadow Detail

It goes against our creative grain to apply hard rules regarding how lighting designs must be

implemented. What works well for one photographer may not create the desired effect for another.

Extensive lighting contrast creates a mysterious mood; details are hidden. Such images allow the audience to imagine what is not seen. The lack of detail allows the viewers to create some of the story in their own minds.

However, if the goal is to allow the target audience to fully examine the details of the model’s mohair sweater, all the shadow details must be seen. (Which can make for an unhappy client, and too many of them can cause economic hardship!)

Balancing Highlights and Shadows

There’s a balancing act not only between highlights and shadows but between creative imagination and technical application. What lives in your mind (or that of your client) may not always be easy to achieve, technically.

(If you have not read the previous two page spread, on highlights, please study it, along with the next two pages, on creating highlights and controlling shadows.) As usual, compromises are often a necessity to accomplish happy results.

In short, you need to strike a balance in both how your diffused highlight transitions into shadow and how much detail is revealed

in that shadow. This is what creative problem solving is all about.

Shadow Edge

The shadow edge is a transition area. When you create a hard-edged shadow, the transition happens over a small area. If, however, that area is quite broad, the shadow’s edge is soft and gradual. The hard edge draws attention to itself and becomes a significant character in the visual story line. The soft edge may still be a significant player but does not upstage the subject.

Specular Shadow

If a subject is next to a dark object, that dark object not only absorbs the light that falls upon it, but also steals the light of the subject, and the dark object casts its image upon the subject, too.

To understand how this works, place a shiny white ball (such as a cue ball) on a billiard table. Prop up a black card next to the ball. Watch how the white ball mirrors the black card. The ball now has a dark area on it. The ball mirrors the dark card, fitting the definition of specular. Though we tend to think of a mirror creating a highlight, a dark object can be mirrored in the subject, too. 🌸



Create a Highlight; Control a Shadow

When photographing a broad outdoor scenic image at one of the seven wonders of the world in the middle of the day, there isn't a great deal of lighting control that we can exert.

In smaller spaces, however, there are many lighting tools at our disposal. *(For more on this, please see Chapter 8, "Man-Made Modifiers.")*

The photographic team needs to take control of a situation to not only flex their creative muscles, but also ensure the best technical outcome.

Every time a highlight is created on a three-dimensional subject, a shadow results. Controlling the two are what successful photographers are made of.

Subtractive Contrast Control

In the white ball/dark card example on page 36, the card removed brightness from one side of the subject. The card is our tool of lighting control; and it created a contrasting effect. Therefore, it is referred to as "subtractive contrast control."

Additive Contrast Control

The opposite of the subtractive contrast control is our ability to affect the subject's light quality with an additive control. Before you move that white billiard ball, slip the black 8 ball in front of it and to the right, so that the two balls are touching.

The white ball reflects the black ball. Now, use a white sheet of paper and slide it almost under the black ball, but hold it up. White is reflected onto the black ball. In doing this, you have explored "additive contrast control." You have changed the contrast of that black ball with your sheet of white paper.

Imagine this with a human face. As light falls on one side of the face, creating a shadow on the other, a large white reflector softens the shadow. Now, imagine how much light a silver reflector would create. Consider how much greater that light would be from a mirror.

Key Light

All these examples work with the reflectors, because they manipulate the light that is coming from the main light source. This source is also referred to as the "key light."

Ambient Conditions

In outdoor photography, in direct sunlight, the key light often comes from solar radiation. If it's sunny enough, someone lying on a grassy area will have a natural green reflector, under them. It provides a very natural appearance, but do you really want that green? At times your ambient conditions create a challenge. Yet again, it's your job to control the work environment. The more that you learn

about the tools at your disposal, the greater the expert problem solver you will become.

Surface Efficiency

Every surface absorbs a certain degree of light energy and reflects what's left. The efficiency of the surface has to do with its shape, texture, color, and other features. A white, flat, opaque surface can be 90% efficient.

Specular Diffusion

Just like how sunlight becomes diffused once clouds begin to fill the sky, you can control the highlights that you create with diffusion material. Imagine the harsh direct noon light of a sunny summer's day. It makes models squint their eyes. Now imagine a white bed linen coming between the sun and the talent. The specular highlights soften, as do the shadows. (By the way, bed linens are not a very efficient means of diffusing light. Too much illumination is reflected, not transmitted through the fabric, which reduce the exposure opportunities. The light that does pass through the cloth tends to shift the color balance of the entire image). Don't necessarily do all the things we ask you to imagine! 🌟



Brightness

There's a crazy, misguided philosophy that with digital photography you can just shoot the picture, no matter what, and fix it later in Adobe Photoshop. While it is true that Photoshop and its Camera Raw plug-in allow you to do things that were previously unimaginable, even in the early 1990s, you still need on-the-money exposure to produce a great digital image.

The work you do after the image is taken is generally referred to as "postproduction."

When the lead actor in a feature film becomes ill and can't work that day, someone might be heard saying in jest, "No problem; we'll fix it in post." Similarly, when your exposure is off by six or seven stops, it will do you just about as much good to say, "We'll fix it in Photoshop." Like the actor, it's just not there.

Never allow yourself to think that you can do a lousy, haphazard job in production and make up for it in postproduction. Not only will you have a poor raw image, but you are saying, "My time is worthless."

Every moment of your life is valuable. Make the most of it.

When you're working in Photoshop, do great new things to make your images even better, rather than making up for what you did poorly with the initial production. Start with the proper illumination. Understand the

brightness range of the photo. Expose for the desired result.

Expose for the Diffused Highlight

As we discuss on pages 34 and 35, the diffused highlight is everything when it comes to determining exposure.

Think of that brightness neutral zone as a child's swing at rest. When the swing moves forward, it's heading toward the highlights. The shadows are when the swing goes backwards from its resting point. If you swing way too far in either direction, you risk falling off or breaking the swing set!

Brighter Is Better

In most cases, the brighter the shooting environment, the better your chances of grabbing a great photograph. Your sophisticated digital single lens reflex (dSLR) camera has all the means of dealing with bright ambient conditions, but has fewer preferred remedies to insufficient illumination. Keep "brighter is better" in the forefront of your production planning mind.

Brightness Range

Tone and color combine to form a brightness range. This range of brightness runs from the photograph's most specular highlight detail to the darkest visible detail in a shadow.

Always keep the analogy of the swing in mind. A safe dependable brightness is five stops from the highlight to the shadow.

Therefore, if your diffused highlight is $f/8$, the specular highlight is $f/4$ and the shadow detail is $f/16$.

Think of the raw photo as your starting point and the end use as the finish line. We go into the reasons for how brightness ranges vary in Chapter 4, "Light, Color, and Use." The end use determines everything. For some uses, such as exhibit prints, your brightness range can be greater. However, if your images are intended for everything from the Web, to television and to media that is not on your mind at this moment, you have to think conservatively about brightness.

Photoshop Done Right

When you do get down to business in Adobe Camera Raw, you may want to adjust your exposure and brightness before creating the working file. You are better off if you have great highlight exposure. If the highlight information is not there, it's tougher to successfully recover that element of the raw image. It's easier to run the exposure and brightness controls down a bit than to bump them up. (Please see Chapter 6, "Raw Files and Scanned Films," for more information on this.) 🌻



Tone

A tone is an area of uniform density that separates itself from the lighter or darker areas that surround it. Light and tone are interconnected, whether in color or black and white images.

Tonal Theory

How we see a tone depends on the other tones that surround it. When a dark tone in a photograph shares space with a sea of neighboring lighter tones, the lighter elements seem minor to the eye when compared to that dark patch. The dark tone just jumps right out of the image, crying for attention. Its neighbors take a seat in the image's upper balcony. The same is true of a rich, brilliant little red patch that's surrounded by pale yellow tones. With the yellow's lack of emphasis, the red has taken center stage.

Color Harmony

Ideally, you want all the colors in the composition to be team players. This cooperation requires an eye for the harmony of the colors in your photographs and the role that light plays.

Look to nature for your inspiration in spotting harmonic colors. Study farmland and observe how planted fields change throughout the year. Observe the undisturbed forest areas. Enjoy natural coastlines. Visit a gorgeously designed garden or park.

In them, you will find color harmony. All the elements work well together. The colors play off each other. These tones are a visual symphony. The better your mind's eye can discern what is harmonic color and what is discordant, the better your awareness of color combination issues will become.

Light and Tones Working Against Your Work

Some tones present problems that your best efforts miss.

It hurts our sense of professional accomplishment to create an image that appears flat. We strive for images that appear to have three dimensions, even though they have only height and width. We achieve the appearance of depth with light.

It's easy to shoot one photo after another in a setup that has given us many successful image-making sessions: it makes sales and it wins praises. We continue to use it or recreate variations of it.

Imagine a dark background with a hair light, that ought to be an added attraction (*please see pages 20 & 21 for light's direction*). The hair light gives just the right dimensional qualities to the photos. It works for subject after subject until a blonde with plenty of puffy hair enters the picture. The hair light creates a glaring yellow halo around her head. Now

the photo session is the story of her hair, as if her face, no matter how pretty it may be, just came along for the ride, way in the back of the van. In this case, tonal interaction is now working against you.

Playing It Safe?

How do photographers play it safe with these possible tonal conflicts? On pages 52 & 53 we explore high-key photos, a visual direction that goes back to the celebrated master painters of Europe. Some of the professional photographers who have made a name for themselves with high-key portraits prefer their subjects dressed in white, posed on white backgrounds, flooded with plenty of even illumination and rim light, too.

We encourage photographers, even those with a high success rate, to carefully study every subject and create a custom environment that does wonders for each sitting. An eye that is always on the move does well for everyone.

Find the color harmony.

Discover the contrasting tones.

Draw out the tones that play with each other, creating individualized images that challenge you as a photographer, every day, and winning you creative (and, hopefully financial) applause. 🌸



Hue

Many visual communicators hide from their lack of understanding of what color hue is all about. Hue, saturation, and brightness are not often explored, in depth. Together, they are referred to as the “HSB color model.”

Hue, Saturation, and Brightness

Hue is one of the three dimensions of some color spaces. First, be sure that you understand hue’s cousins, saturation (*pages 48 & 49*), and brightness (*pages 42 & 43*).

Hue is the purest elements of the colors: red, green, yellow, orange, blue, and so on. Hue has no tint; it has no shade. It is the pure color. On the color wheel, hue makes the full 0° to 360° rotation. Whatever you explore in color, hue has to be there.

Saturation is sometimes called “chroma.” It represents the amount of gray a color has in proportion to the hue. It’s measured as a percentage from 0% (gray) to 100% (fully saturated). On a color wheel, saturation increases from the center to the edge.

Brightness is also measured as a percentage, on a scale of 0% (black) to 100% (white).

What Does Hue Have to Do with Photography?

It has anything to do with image-making that we want it to! Some of it has to do with composition. Some of this gets into postproduction.

Open any image in Photoshop. Go to Image > Adjustments > Hue/Saturation. You will see the HSB options (“Brightness” is referred to as “Lightness”) Be sure that the Preview box is checked.

Bump the hue slider in either direction or double-click the numeric value and use your keyboard’s up and down cursor keys to increase or decrease its values in increments of -1 or +1.

Notice how -180 and +180 look the same. This demonstrates how hue runs 360° around the color wheel.

Treat Color Like Black and White

Challenge yourself, further. Approach a color image as if it is a black and white photo. Create a scene that is all about a single color, with just a single hue as the center of the photographic series. Consider a study in yellow, or blue, or green, or whatever pure color fits your study.

Make it about barns, or the ocean surf, or trees, or flora, or racing cars, or front doors, or whatever moves you. Then, expand your vision to include people in this monochromatic challenge of hues.

Stretch your comfort zone with every opportunity that presents itself. Just because others do not understand how to make the most of hue, don’t join them. Once you get comfortable there, stretch yourself some more. Never stop. 🌸



Contrast

The term “contrast” wears many hats in photography. Learn to wear all of them.

Black and White

When we apply contrast to a monochromatic image, it refers to the difference between the lightest and darkest regions of the photograph. It’s all a matter of relationships and intensities.

Color

For the full spectrum of color, it’s all about boldness. Some contrasting colors are so brash that they almost seem to be screaming at each other at the top of their lungs. Their full-throated cries seem most appropriate when the two competing colors are 180° from each other, on the color wheel.

We associate the Christmas colors of red and green with the opposite sides of the color wheel, but try blue and orange in the natural setting of bright orange floral blooms against a crisp blue sky.

Now that’s color contrast.

Lighting Contrast

In the most simple terms, contrast, in light form, has to do with the difference between how much illumination reaches the brightest and darkest portions of a scene. To study how we can apply this to artificial illumination, we need to spend some time exploring the extremes of nature’s contrasting light.

Atmospheric Contrast

To learn what this is all about, you need to go further than your front yard. Pristine white beaches, surrounded by clear water, offer great contrast.

When the sky is clear, at higher altitudes, the sharper blue sky offers contrast to any brilliant color that is willing to take it on, as direct sunlight bathes anything in its path.

Flat plains and their unending miles of agriculture leap out of a photo when a huge piece of brightly painted farming equipment seems tiny by comparison, under bright light.

Anywhere that dark clouds on an otherwise unsuspecting horizon seem both foreboding

and visually jarring, you have an atmospheric contrast that’s begging for a photo.

Hard Light

We do not experience a great deal of contrasting illumination under soft light. We’re used to softer, more comforting light. However, hard light is not what we experience on a day-to-day basis.

When confronted by hard light, most people do not identify it as such; so it grabs their attention, because it is outside of their ordinary serenity.

What to Do?

How do you use lighting contrast to convey visual messages? Do you choose a hard light to get attention, even though it might agitate your viewing market? Knowing that a less contrasting illumination is more peaceful, do you lean toward tranquilly lit images? 🌸



Vibrant, Saturated, and Muted Colors

Color is a seductive attention-getter. It can draw the eye into a photograph, sometimes to the point of distraction.

Vibrance and saturation are the chromatic tools that grab our eyes. How to use these tools is generally a personal choice.

Color Psychology

Highly saturated colors tend to catch us off guard. When they are strong, we sometimes think of them as garish.

Color evokes emotion. It's a very personal thing. A color that seems inappropriate in one situation is considered delightful in another. Though we may get sick of a bathroom sink that's in a fully saturated red, yellow, or blue, those identical colors make great children's crayons or blocks.

A bright red sports car gets as much attention as a yellow taxicab. However, some people tend to think of the drivers of bright-colored cars as folks who are begging for our attention.

Most of the colors we see are to some degree unsaturated. Most brides do not walk down the center aisle of their church wearing a dress that's fire-engine red. When we see red, yellow, and green, together, and fully saturated, we think of traffic lights. So a color, in its full chroma, is not the norm.

We think of pastels for a baby's room.

Those muted tones cause us to think of quiet and peaceful moments. Mauve is a popular color in some medical facilities. It's a derivative of red, which in its full chromatic glory would bother those who were not feeling well and make their loved ones feel uneasy, if it loudly covered the walls of a hospital room.

Saturation

As discussed on pages 44 & 45, saturation is a hue in its purest form. It's a color in its full vivid capacity. Fully saturated, for instance, blue is a color with an absence of gray that would tone it down.

To photographers, "brightness" refers to the intensity of illumination. Yet many call heavily saturated colors "bright."

Vibrance

Like saturation, vibrance pumps colors to their purest hue. Adobe Camera Raw provides a Vibrance adjustment that raises the saturation of all lower-saturated colors with less alteration to the higher-saturated colors. This is a popular option for photographs of people. The vibrance adjustments preserve the skin tones so that they do not become unnaturally oversaturated. *(For more on vibrance, in Camera Raw, please see Chapter 6, "Raw Files and Scanned Films.")*

Muted Colors

Much like the word "tone" we use another word that has to do with sound when describing a color that has been quieted: "muted."

Many colors in nature are brilliant, such as various floral petals. They create splashes of welcome color that bring us joy. Most colors are somewhat muted. The clothes we wear, the paint on our walls, and the fabric we choose for upholstery are quieted by tones of gray or diluted with white.

The Color of Light

We are used to a day of varied light from the sky. Some may never notice that the light changes throughout the day, yet most will find great joy in the unanticipated colors of a brilliant sunrise or sunset.

When warm yellow light breaks through the cool tones of morning fog, we feel good.

Some unexpected colors in nature concern us. If the sky takes on a greenish cast, many think of a tornado. Destruction and violence comes to mind. It makes us feel small, fearful, and without control.

Yet when the setting sun illuminates the clouds with colorful magentas, bathing everything in warm light, it brings us joy and leaves us in awe. 🌻

The yellow of the cake and the delightful white and chocolate frosting are soft pleasant colors. The presence of the saturated red roses provide a contrast that draws the viewer to the image.



High-Key

To communicate with many professional photographers, “high-key” and “low-key” are two must-learn terms. To wedding and portrait photographers, this is standard jargon. However, these terms go beyond pictures of people. They’re applicable to any image.

Tonal Response

One of our primary visual responses is to tonal contrast. We respond to the difference between light and dark areas more quickly than we do to color contrasts. Though there is more information to glean from color images, black and white effectively communicates with us more rapidly. It’s our retina’s rod cells beating the cones to the story, as we explored on pages 22 & 23.

High- and low-key images are based on the prevailing tones of either light or dark.

High-Key in Nature

To fix high-key imagery in your mind, think of a snow scene with a blonde woman and child, both dressed in white. There are few shadows. Dark tones are missing. We see very few mid tones.

A painting of a white horse, on a clean white beach, is another picture that typifies high-key, as a found visual. The eye quickly understands the message.

We easily understand why this is popular with the wedding photography marketplace. The white implies purity and youth. It’s perfect for portraits of children, too. There’s something almost angelic about high-key.

Young couples enjoy outdoor high-key photos. They make for terrific engagement photos that are referred to as environmental.

This technique is great for young parents with a newborn baby, as well.

Finding the right setting is essential. It’s not something that can happen anywhere. Somewhere private is best.

What It Isn’t

We sometimes confuse high-key with low contrast. That’s not the case. High-key can have a full range of brightness and contrast. It’s just that the lighter tones are dominant in the image. Attempting to increase the brightness, while reducing the contrast of an image to make it high key often just renders the photo looking poorly exposed.

Lighting for High-Key

It takes a bit of lighting equipment to create a high-key photo, should you want to bring your subject indoors.

This method is often used on a light background, which can be thrown out of focus,

and flooded with light. That draws attention to the subject, while the background is practically nonexistent to the viewer.

The light is often quite diffused, providing a softness to the photo. Shadows are minimal. It’s popular to bounce additional illumination off the ceiling to create a sea of light that washes everything in the room.

Though Janet’s shot of Mia Handy to the right has some shadows, the overall brightness of the environment says “high-key.”

This is a perfect situation for a studio flash system and a large light bank. *(Please see Chapter 13, “Digital Studio Flash” and Chapter 8, “Man-Made Modifiers,” respectively, for more on these invaluable tools.)*

High-Key Still Life

The people shooters don’t have an exclusive hold on this technique.

High-key product images are all over the websites of Internet retailers. All that white space provides these merchants with clean, fast-loading pages and a sense of openness and being trustworthiness.

High-key is also perfect for bringing a little nature into the controlled environment of the studio. Cut flowers, in a high-key setting, speak of simplicity. Healthy foods on a clean white or glass plate are excellent subjects for this kind of setup. 🌸



Low-Key

Dark tones dominate the low-key image. Photographers have not invented these techniques. We can see them in paintings from centuries ago.

Low-key lighting was perfect for the old European masters. They worked before the days of electricity, when window light was a key source of illumination.

Low-Key in Nature

To this day, window light is a perfect tool for low-key photography.

Today, we regard many low-key photos as being moody or as vehicles for male subjects who have a mysterious wisdom or strength about them.

Low-key photos are often used in commercial photography when the content of an advertisement or editorial piece is about someone who is troubled or depressed. The dark backgrounds and deep shadows have a great sense of the unknown. These images evoke sympathy from the audience. We want to reach out to the subject or have a sense that we feel their pain.

On the opposite end of the spectrum, low-key lighting is perfect for those who are spiritually enlightened. A smiling pastor both appears to have knowledge of the otherwise unknown and looks like an indispensable re-

source when we find ourselves in a dark place and need some assistance.

Some young people tend to like low-key images of themselves. They may feel that it depicts them as having greater depth. (Of course, it's not always their parents' choice, who may still see them as children, and prefer brighter, happier photos.)

Lighting for Low-Key

It's not easy to make low-key photos outdoors.

The technique, like high-key, is typically crafted with soft shadows. On the editorial or fine-art side, hard shadows may send the desired message.

If you choose natural window light, you'll want to darken the rest of the room. You'll probably need to modify the light coming through the window with a scrim material, if you're after soft light. *(Please see pages 256 & 262, for more on this.)*

As with high-key, lighting for a low-key portrait sitting lends itself well to studio flash. This setting is where a controlled environment works best. A single small or medium light bank is all that you need. It may be better than a large bank that will spill light elsewhere in the room and prevent you from attaining the desired darkness. It creates a very directed light source. Minor adjustments in

the direction of the light can bring about aspects of your subject's facial features that you may have previously not seen. The intensity of the instantaneous flash allows for faster shutter speeds, permitting the rest of the room to go to black.

The trick to lighting for low-key is that you get sufficient details in your shadow areas. If not, it can just look like you have made a poorly exposed image.

Because low-key is a departure from the standard portrait, you may need to share the progress of the shoot with your client as the session evolves.

Low-Key Still Life

As we discussed on page 27, a dark surround adds great mystery to product photography. It has become something of an expected element behind all of the hoopla that goes into a major product announcement, providing little glimpses of what is about to roll out as the days count down to an industry-wide keynote address. It has become the stuff that big trade show events are made of. 🌸

Janet's photo of Christie Mayo and Jacquie O'Connor, to the right, proves that low-key is not a male dominated lighting technique. It work beautifully for woman and children, too.



Weather's Light

When the weather's bad, grab your camera and get out there!

Safety

The disclaimer is that safety comes first. Not only do you need to be careful about wind, lightning, extreme temperatures, and visibility, but there are many tragic stories every year about people driving through deep water. Snow and water hide danger below the surfaces that tires and feet do not expect.

Fog

Cloud cover that clings to the earth creates fog conditions. The water droplets are far more refined than raindrops. The visibility becomes limited. Illumination is extremely diffused as the light is scattered, bouncing about the tiny droplets.

Due to the reduction in visibility, many objects go unseen. Our attention is drawn to what remains for us to view. Many of the background elements disappear. We have no

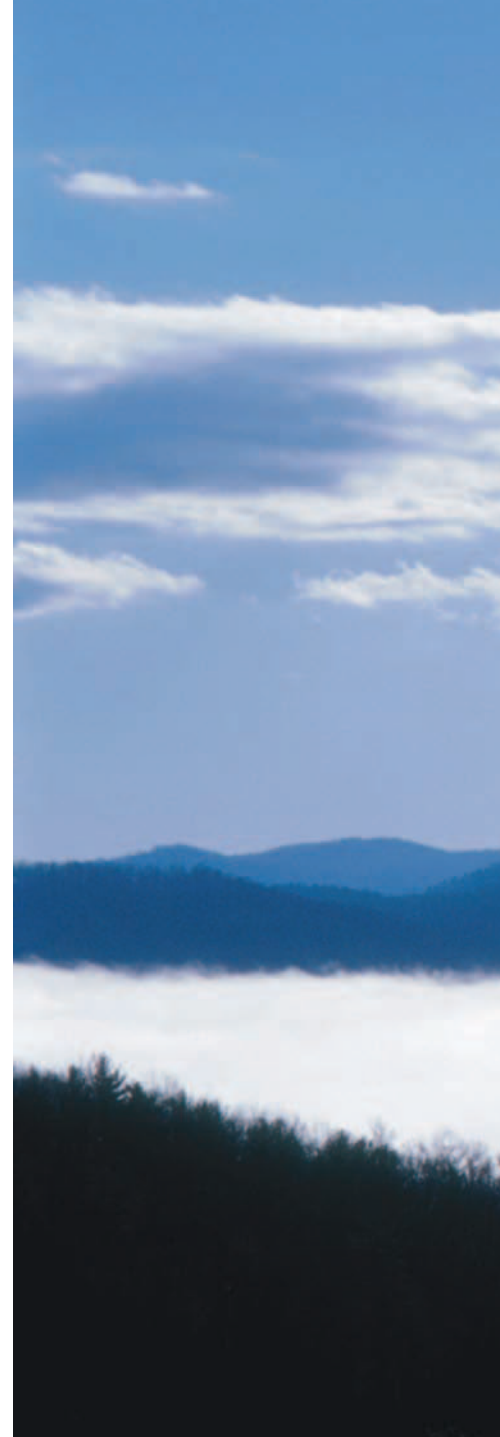
choice but to focus upon a more simplistic setting. We are attracted to the unique view.

Snow

As with fog, a snowfall provides us with an excellent opportunity to see some very unique light situations.

We are accustomed to light coming from above and a fair amount of it being absorbed, once it strikes the earth's surface. However, with a fresh cover of white snow on the ground, roughly 90% of the light that strikes the snow bounces back.

While we still have cloud cover, the color temperature of the light tends to be cool and is extremely diffused. However, once the sun appears, a unique color contrast becomes available. Though everything looks quite cold, the color temperature returns to around 5,500 Kelvin, as discussed on pages 16 & 17. So we have some chilly subject material bathed in warm illumination. ❄️





After a Tropical Storm

Once a tropical storm passes by, the sky can open up with a most beautiful array of colors, rarely seen in some regions. It is as if it has transported another region's personality into your backyard. A vacation paradise has come to your doorstep, as if to ask your forgiveness for any inconvenience or havoc that it has wreaked upon your neighborhood.

It has a way of brightening not only your sky, but also your mood, and it deserves a series of joyful and stunning photographs.

Emerging Sun

Even after a common rain shower, the atmosphere can remain charged with frozen precipitation that is still on the move.

The rain that falls to the ground, no matter how warm it is on the earth, starts as crystals, in the sky. As the crystals fall into warm air, they liquefy.

While still in the clouds, upper winds push the crystals about. They can capture the sun's rays and like a huge army of tiny mirrors, they reflect the colors of the sun back to us on earth. With an extremely long telephoto lens, we are able to get the feeling that we are right there, up in the sky, as it's happening. 🌈

Capturing weather skies requires some long telephoto optics. Brian photographed the fog image on the previous spread with an AF Zoom-Nikkor 80-200mm f/2.8D ED. The image on this page was imaged with a 35mm equivalent focal length of 900mm.

It's an AF-S Nikkor 300mm f/4D IF-ED with a Nikon AF-S Teleconverter TC-20E II, doubling the focal length to 600mm. The camera is a Nikon D2x. The DX format adds an extra 50% to the focal length for the impressive angle of view.



The North Light of a Painter's Studio

Leonardo da Vinci wrote, “The light for drawing from nature should come from the North, in order that it may not vary. And, if you have it from the South, keep the window screened with cloth, so that with the sun shining the whole day the light may not vary. The height should be so arranged as that every object shall cast a shadow on the ground of the same length as itself.”

In the northern hemisphere, the sun tracks to the South, rising in the East and setting in the West.

Northern exposure has been a preference of artists for centuries. The illumination is somewhat even, throughout the day.

Interestingly, what da Vinci is suggesting is that windows with southern exposure be covered in a diffusion material, as is popular today. Though southern exposure is preferred by gardeners for their sun-loving plants, da Vinci felt it was too variable for the amount of time that was required to draw or paint.

Fortunately for photographers, making most photographs happen takes less time than it takes to complete a painting. 🌻

Apply the principles of northern and southern exposure to your own photography. Use soft and hard ambient conditions to your advantage.







Digital Exposure and Optics

Until you understand the exposure and optical technologies in a digital photographic environment, you will have a difficult time beginning to reach your creative potential.

Even if you are coming into this after years of work with traditional emulsion and chemicals, it seems a bit daunting. We'll never forget the day that four of us who worked together for more than twenty years unpacked a box of four Nikon digital single lens reflex (dSLR) cameras. A little bit of time passed before we got the hang of it. Once we did, though, we began to make the best images of our careers.

If there's one chapter in this book that you need to study, backwards and forwards, until you're comfortable with what's on every page, it's this chapter.

Don't rush yourself and don't prevent yourself from exploring the rest of the book.

If you're new to all of this, it may take at least few weeks with daily practice before the technology becomes second nature.

If you've earned your battle scars in the world of film, do not assume that you already know most of this. Revisit everything. Embrace this as a fresh start. When you assume that you already know it all, you're probably denying yourself the opportunity to discover a few new nuggets that will move you forward in great new directions.

We approached this chapter with the intent to provide a new perspective on as much of what's involved in exposure and optics that we could stuff into the next sixty-eight pages, the biggest chapter in the book. Admittedly we concluded writing it with a new view on every topic, ourselves. 🌸

The Exposure Trinity

One of the keys to capturing images is understanding “exposure.”

The exposure of light sensitive components has three inseparable elements:

- Time
- Sensitivity
- Volume

This trinity is a dynamic relationship.

What’s exerted upon one of the components affects the other. There’s a family harmony to exposure. As one moves, the others respond and move with it. The three of them do everything together. As long as we do not interfere with the harmonious relationship, everything remains in a beautiful balance.

It’s up to us to grow continually in our understanding of that harmony, be obedient to exposure’s natural laws, and love to explore how we can enjoy it.

The exciting synergy of the relationship is both technical and creative. The technical aspects of exposure must be fully understood by the successful photographer. At the same time, using that technical know-how is the key to unleashing the photographer’s creative energies and bringing what the mind envisions into the reality of the finished image.

Unless you can understand and control exposure to your fullest advantage, you will struggle to feel satisfied with your photo-

graphic endeavors. Even some accomplished professional photographers do not understand exposure very well.

Once you have these three components in balance, and working for you, you’ll gain a greater sense of photographic achievement.

At times, one component will not be a variable, leaving you to strike a balance with just the other two. Though that leaves you with fewer cards to play, it solidifies one side of the triangle and assists you in determining how to best establish the other two.

Digital Is Better!

The digital photographer has an advantage in many ways and exposure is one of them.

With film, sensitivity is not a variable. The film’s ISO (a standardized scale of film speeds) is determined by the manufacturer, and though the entire roll can be push or pulled, in the photo lab, the ability to change the sensitivity from frame-to-frame does not exist.

As we explore fully, on pages 76-79, sensitivity can be changed by the digital photographer at will. As conditions change, the camera can be set to change the sensitivity for you.

This function provides a magical freedom to respond as light varies and the situation demands, or as your creative side calls.

Flexibility in Balance

Under the exact same lighting conditions, you can change one of the components in the triangle and create a very different photograph.

Change the volume of light entering the camera body by opening the aperture further and the depth of field changes. What was once an image that had everything in focus becomes a photograph where our attention is directed by force to one object.

Alter the time that the shutter stays open and what was once in sharp focus becomes a beautiful blur.

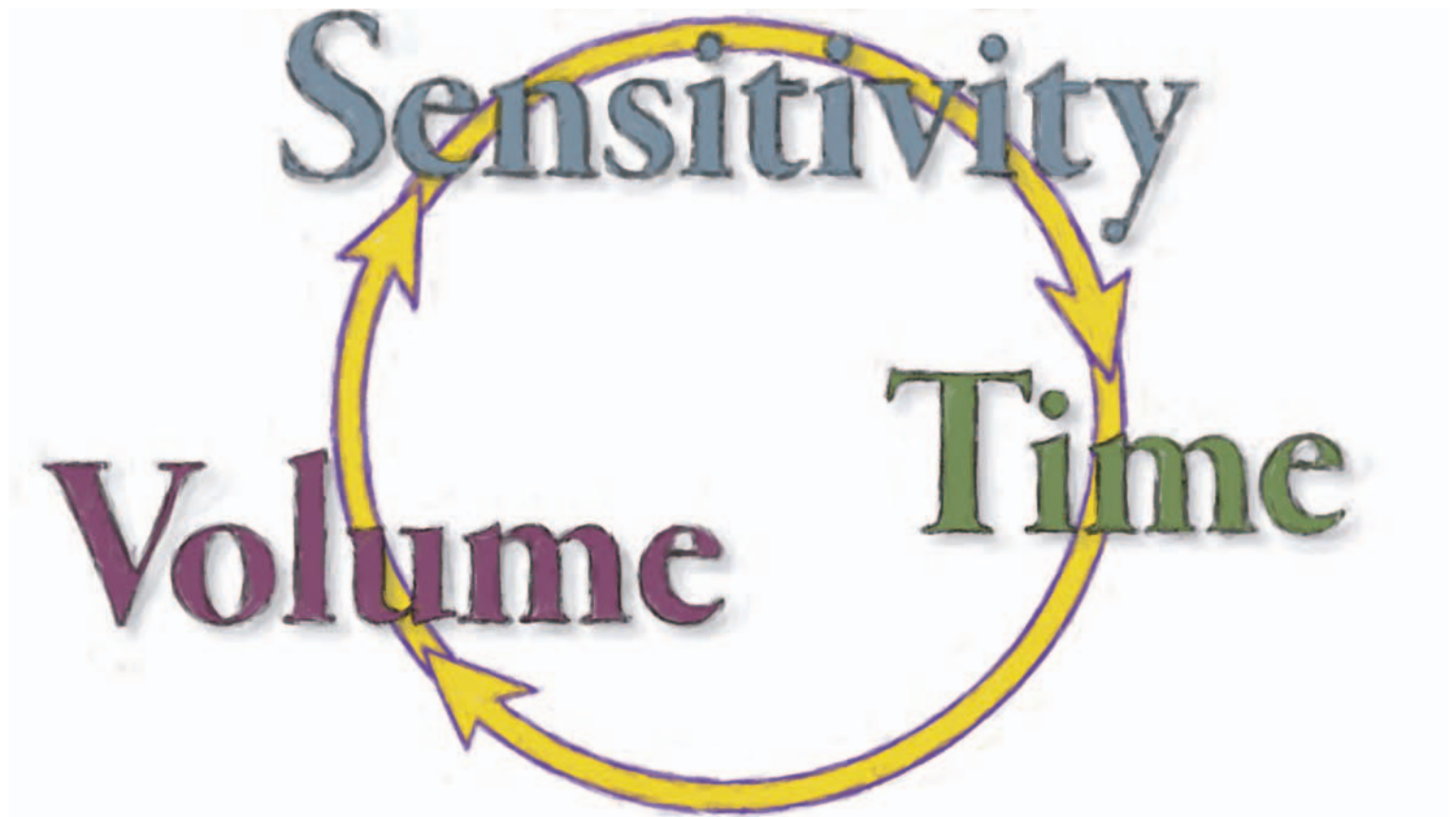
Increase the sensitivity of the sensor and go from a near pristine image to one that has the grainy characteristics of a fine artist’s photographic expression.

In order for the volume to increase, the time must decrease.

When we open the shutter for a longer time, we must close down our aperture so that a lesser volume of light comes in.

If we want a grainier image, we must adjust for less time and volume.

It’s all a matter of a family of three, in beautiful harmonic balance. 🌸



Time, Sensitivity, and Volume

Digging deeper into the exposure trinity's relationship reveals how these three components interrelate. Please study the examples to the right. Notice how broad the options are to master exposure.

Let's explore three elements that are analogous to each exposure component.

Time

Imagine a main curtain in a theatre.

The lights shine on the curtain and the lip of the stage. It rises and reveals that the stage behind it is dark. The light that was shining on the curtain now spills back into the darkened area. The performance begins and lasts for thirty minutes. Once the performance is over, the curtain falls.

For thirty minutes, the darkened stage behind the curtain was exposed to light.

That's pretty much how the shutter curtain assembly works on your digital single lens reflex (dSLR) camera.

Sensitivity

Think of sensitivity as a sheet of a dozen unbaked cookies.

They start out with a tan color when you pop them in the oven. In regular intervals, you open the oven, take a spatula, and fetch another cookie. The first one is just about the

same color as before they went in the oven. The last one to come out is a golden brown. In between, there are ten other cookies in gradations darker than cookie #1, but lighter than cookie #12.

Volume

Instead of light, think in terms of another one of life's essentials: water. Imagine three water goblets of the same size.

Place goblet #1 under the faucet. Open the faucet to just a trickle. It will take a while to fill the glass.

Now, place goblet #2 under the faucet and open it half way. It fills the glass more quickly than the first.

Finally, open the faucet all the way, with glass #3 under it. It fills the goblet in almost no time.

Goblet #1 is like stopping-down a lens to its smallest aperture: $f/45$. It takes a while for enough light to reach the camera's sensor.

The third goblet is like $f/2.8$. The light just floods in.

Goblet #2 is right between the minimum and maximum apertures, at $f/11$. 🌸



A Trickle of Water Volume is Like $f/45$'s Volume of Light.

Light enters the camera much like water comes into a goblet. The aperture is the faucet handle. The wider open the faucet, the greater the volume of light that streams onto the camera's sensor.



The Volume of Light, at $f/11$, is Like Normal Water Flow.



$f/2.8$ Presents a Flood of Light.

The Time Factor

There wasn't a shutter on those first cameras, which used metal plates. It took so long to make an exposure that the photographer simply removed the lens cap, observed his watch, and after a period of time, put the cap back on the camera. Nevertheless, time was still a factor in making a photograph.

Shutter Speeds

Your Nikon digital single lens reflex (dSLR) allows you to choose a shutter speed as slow as 30 seconds to as fast as 1/8,000 of a second. As much as you cannot imagine anyone sitting still enough for a whole 30 seconds, as the first photographers needed, it's tough to envision the speed of 1/8,000 of a second.

Both of these speeds allow you to record an experience that we cannot witness in life. Unlike a movie, where the images move past our eyes in real time, we can stare at a photograph and study what is before us. Frozen in time is an athlete jumping, in midair, or a jet lifting off the runway, in a small fraction of a second. Captured forever is the smooth blur of water falling over rocks or the lights of cars at night, recorded over a few seconds.

Many photographs are made in the range of 1/60 to 1/500 of a second. Most subjects are frozen in action at 1/500. However, many cameras cannot photograph sharp images,

without a tripod at 1/15 of a second, even with a wide-angle lens.

At 1/60 of a second, the shutter allows in twice as much light as at 1/125.

To those new to the SLR, when you look at a control panel, 1/30 of a second appears as just the number "30," whereas 30 seconds is expressed as "30'."

The "B" stands for "bulb." This setting allows the shutter to remain open for as long as the shutter release button is depressed.

Shutter Curtains

The best way to intimately understand your camera is to get under the hood.

Unlike film cameras, in which you opened the back and saw the shutter curtain, in a digital camera, it's pretty much hidden from view. However, it's there, right behind the mirror.

Since the days of the first SLRs, shutter curtains have become far more sophisticated, but the basic principle remains the same. There are two curtains: one is in front and the other is right behind it. The shutter assembly is close to the sensor.

For long exposures, one curtain opens, exposing light to the sensor. When the exposure time is over, the second curtain comes across the assembly to conclude the exposure.

With shorter exposures, the first curtain opens and then, traveling right behind it, along comes the second curtain. The entire sensor is not fully exposed to light at any given time. The two curtains work in tandem for what is more like a fast-moving slit. The faster the shutter speed that you select, the more narrow is the slit's opening.

Incremental Adjustments

Typically, shutter speeds progressed in steps that doubled or halved the adjacent speed, such as 1/30, 1/60, and 1/125. These are referred to as "full stops."

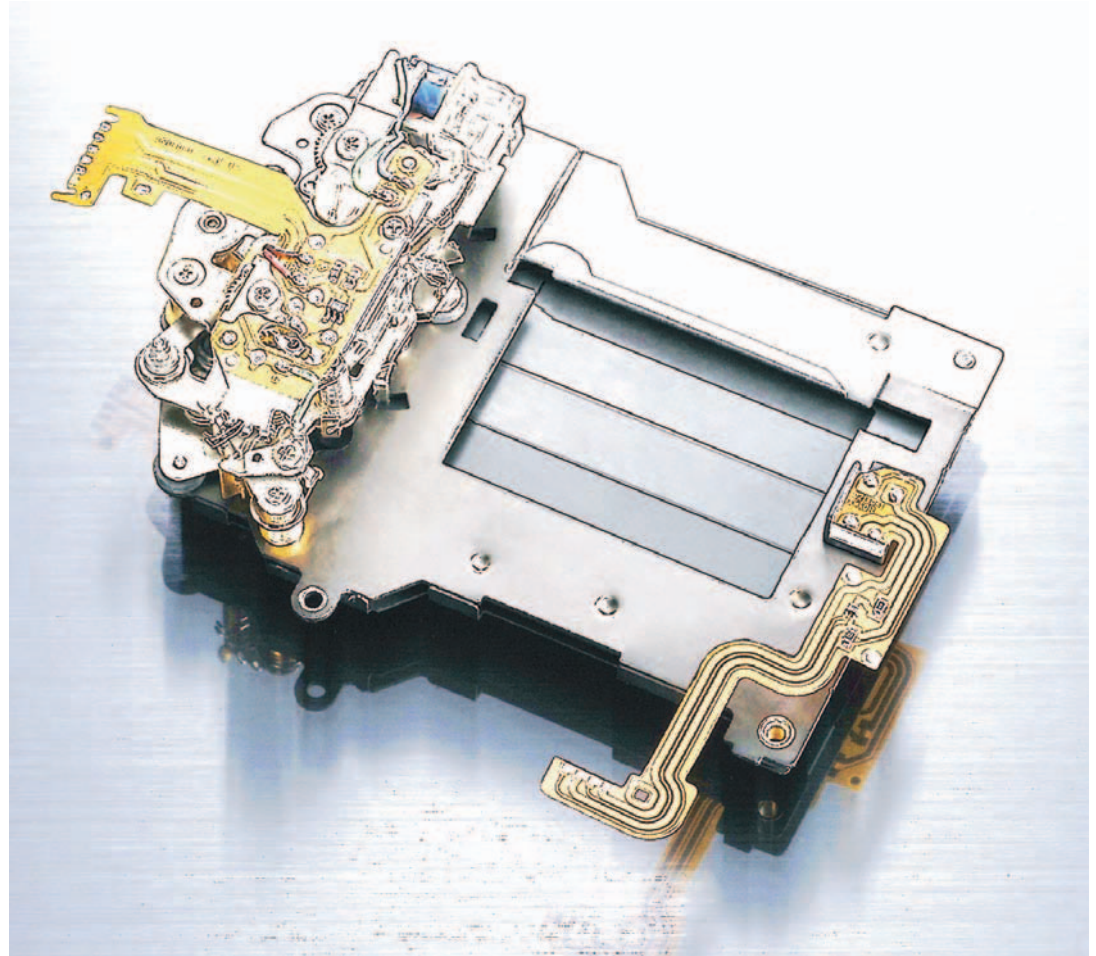
Your Nikon dSLR allows you to choose your shutter speed in third stop increments. In between 1/30 and 1/60 are 1/40 and 1/50.

Autoexposure Priorities

Your Nikon dSLR permits a variety of autoexposure modes. One of them is shutter priority. *(Please see page 85, for more on this.)* It permits you to choose the shutter speed; and the camera finds the appropriate aperture.

When the top priority in capturing the image is how long or short the shutter curtains remains open, shutter priority is your best choice. The opening of the aperture is then the secondary consideration. 🌸

The shutter assembly of a Nikon D3 or D700 is an electronic marvel. This is a dramatic departure from the original film SLRs, which were primarily mechanical in design.



Camera Movement, Shake, Image Stabilization

Keeping the camera firmly planted during a shoot is essential to getting that crisp photo. The elements are often working against you and at other times, your own judgment can be your worst enemy.

The Need for Speed

If blurs are not an intentional creative choice, you need to find the ideal shutter speed for the situation.

Our bodies are not as steady as we may think. The higher-end Nikon dSLR cameras are capable of recording a photo with a resolution that's high enough to print a crisp 24" x 36" print.

That's the good news.

The downside (if there is one) is that the photograph needs to be more razor-sharp than ever. Even minor camera movements are a big problem.

Weather and Environment

Often, environmental conditions work against us when holding a camera by hand.

Conditions can be windy. We're not as steady in extremely cold temperatures, even if we're not shivering.

Sometimes the environment that we're in has vibrations or loud noises.

Often the only remedy is to use a tripod, though we sometimes have no choice but to pull out our camera and begin shooting, or risk losing the shot all together.

Holding Your Own

Some of us are just more steady than others. It may have something to do with your heart rate, your emotional state at that minute, how often you're behind the lens, or your own physical strength and endurance.

There is a rule of thumb that you can hand-hold a camera based on the focal length of the lens. If you convert the focal length to the next highest shutter speed, it gets you in the ballpark of what might work for you. The following are a few examples:

28mm	1/30 of a second
35mm	1/40 of a second

50mm	1/60 of a second
85mm	1/90 of a second
105mm	1/125 of a second
135mm	1/160 of a second
180mm	1/200 of a second
200mm	1/250 of a second

Test-drive this concept. See how it works for your situation before trying it out on an important shoot. View your images on your computer's monitor at 100%. Carefully examine all the details for sharpness. If it didn't work, try the next fastest speed.

Image Stabilization

Some Nikkor lenses have a vibration reduction feature that is similar to shooting at three stops faster than the shutter speed you've chosen. *(Please see page 110, for more on this.)* 🌸

Be a Tripod



If you don't have one of your tripods with you, make yourself into as much of a tripod as you can. Try one of the following methods for just a short time.

A Bench or Stool

Find a bench or a stool or an apple crate and sit on it. Grip the camera firmly with one hand. Hang onto the lens with the other hand. Rest your elbow on your leg.

Balance Yourself

Find something on which to rest yourself (and maybe the camera). Doorways are good. Cool car roofs with a towel work. Fence posts and balcony railings aren't bad, either.

Lie Down

You might find some great new angles while shooting from the ground. Try propping up the camera with your elbows.

If You Must Stand

Even if you have a great shutter speed for the lens, body movement can prevent you from getting a sharp shot. Stand with your feet slightly apart and your elbows tucked in, above your legs. Cradle the lens in the palm of your hand. Hang onto the camera's grip with your finger on the shutter release. 🌿



Freezing Action and Beautiful Blurs

Action photography requires a fast eye and a readiness to grab that shot the second that it happens, which takes a little planning. You're usually best off if you can anticipate the action to enter your frame, so that you've composed the image well before it happens.

Working with the Light

Fast shutter speeds beg for plenty of intense illumination. A sunny day is a blessing.

Sometimes, going to the autoexposure mode of aperture priority is your best bet. Then you're fixed on a wide aperture and the camera gives you the fastest available shutter speed. *(Please see page 122, for more on this.)*

The Speed and Closeness

The shorter the time the shutter is open, the more frozen in time your photo will be.

Action is relative not only to sporting events. If you are attempting a close-up image of a small flower's bloom on a breezy day because it fills your frame, you have action to contend with.

A fast-moving car a half mile away that fills one quarter of your frame does not need as fast a shutter speed as the flower. However, when the same car at the same speed, is now twenty-five feet away and filling your frame, you'll need a faster speed to freeze it.

The Beautiful Blur

A blur can be a good thing. It shows motion. Notice the little girl on page 60. She's so happy to be grabbing an apple that we see her whole arm in motion. However, the rest of the image is tack sharp. The motion blur tells the story.

Slowing Down

Just as it is difficult to apply general rules to how fast a shutter speed you will need to freeze a sprinter, it's equally difficult to predict the speed you'll need to suggest movement with a partial blur. That's the beauty of digital: you get to test these things before you shoot the image.

Going Steady

This sort of photography requires a tripod, especially when using a long lens.

You are looking for a speed that is sufficient to freeze the static portion of the image, but slow enough to blur the motion. Camera movement will ruin this opportunity.

A shutter speed that is too slow will cause the action to blur so much that the audience will not know what it is. Again, it's all about finding the balance. 🌸

Freezing the action of actor/model Domenic Scotty fishing, (at right) would have been possible if Brian chose 1/1,000 to 1/8,000 of a second. Instead he selected just 1/160. After a few meter readings and test shots, Brian determined that he could hold the talent's body action sharp, but the blur of the fishing line helps to tell the story of the motion.



Extended Exposure

When combining natural illumination and flash, some powerful creative opportunities become available with a technique called a “dragged shutter.”

Fast Flash

As we discuss in Chapter 13, “Digital Studio Flash,” strobe illumination provides an infinite array of creative photographic tools. The light that these instruments create has a duration that can exceed 1/1,000 of a second.

Flash Time Plus Shutter Speed Time

When we combine the flash, which happens at one rate of speed, with the camera’s shutter, which happens at a separate rate of speed, we have two time variables working to our technical and creative advantage.

This is referred to as “extended exposure,” because after the flash has fired, the shutter remains open for a prolonged period of time to allow all of the ambient light to burn into the image.

Metering for the Moment

The trick is to have the right exposure to balance all the light sources, which takes some great ambient and flash metering skills. Please check out Chapter 3, “Measuring Light and Color,” to meter like a pro. 🌸

The creative set styling of Tracey Lee comes to light in these two architectural interiors.

In both shots, our key light is a large Chimera light bank with one Novatron Bare Tube Head. In the image to the right, the light source is on a tall Matthews stand that is outside the window. The flash fires and the shutter remains open for an eighth of a second to burn in the interior illumination.

On the opposite page, the shutter speed was a full second. This shot required an aperture of f/11. Balancing the exterior light was part of the challenge.





Instead of Film Personality...

For years photographers discussed the personality of films. There was debate over how the results of the various transparency stocks from Agfa, Fuji, and Kodak differed. These companies had various films with improved results for more natural flesh tones or more deeply saturated colors. Wedding photographers and portrait studios had a color negative film that they used almost exclusively. There were choices to make not only over which emulsion rendered colors to your satisfaction, but also about which ISO to choose. Regarding the aspect of lighting, some films exhibited a greater range than others. This meant that a photographer had a greater chance of holding details in both highlights and shadows.

Joyfully, those days are over.

Today, new debates surround digital single lens reflex (dSLR) cameras and the image size that their sensors render.

The dSLR's Film

The imaging chip of a camera is a dSLR's film. This light sensor is to the camera what the retina is to the eye. The space where emulsion sits in a film camera, awaiting its exposure to light, is now occupied by a highly sophisticated light sensing device that's permanently installed in place.

CMOS

Many camera manufacturers have followed Nikon's lead in the use of the CMOS (pronounced like "see moss") sensor. An acronym for Complementary Metal Oxide Semiconductor, this sensor provides a very efficient use of the camera's resources. Every pixel of the sensor communicates information to the camera. It allows the camera's brain not only to record an image, but also to use the information to operate the exposure metering and autofocus systems, as well.

The CMOS efficiency is seen on the Nikon D3 and D700 which are capable of shooting nine frames per second. For image quality and holding those important highlight and shadow details, photographers want a sensor that is capable of a wide dynamic range. This range is notable in shooting high-key imagery such as a fair-skinned blonde model, dressed in white, on a sandy beach that is drenched in sunlight. *(Please see pages 50 & 51 for more on high-key photography.)* The CMOS in the D3 has a low signal-to-noise ratio to make this possible.

Sensor Size and Format

Nikon's D3 camera body was their first with a full-sized sensor delivering 12.1 million effective pixels. It's close in size to the 36 x 24mm

imaging area of 35mm film. When using its entire sensor, Nikon refers to this as their "FX format."

Previous Nikon dSLRs, like the D2x, have half-sized sensors of 23.7 x 15.7mm, recording 12.84 million total pixels, known as the "DX format."

Cameras like the D3 offer the choice of FX or DX plus the 5:4 format that some smaller camera manufacturers have adopted.

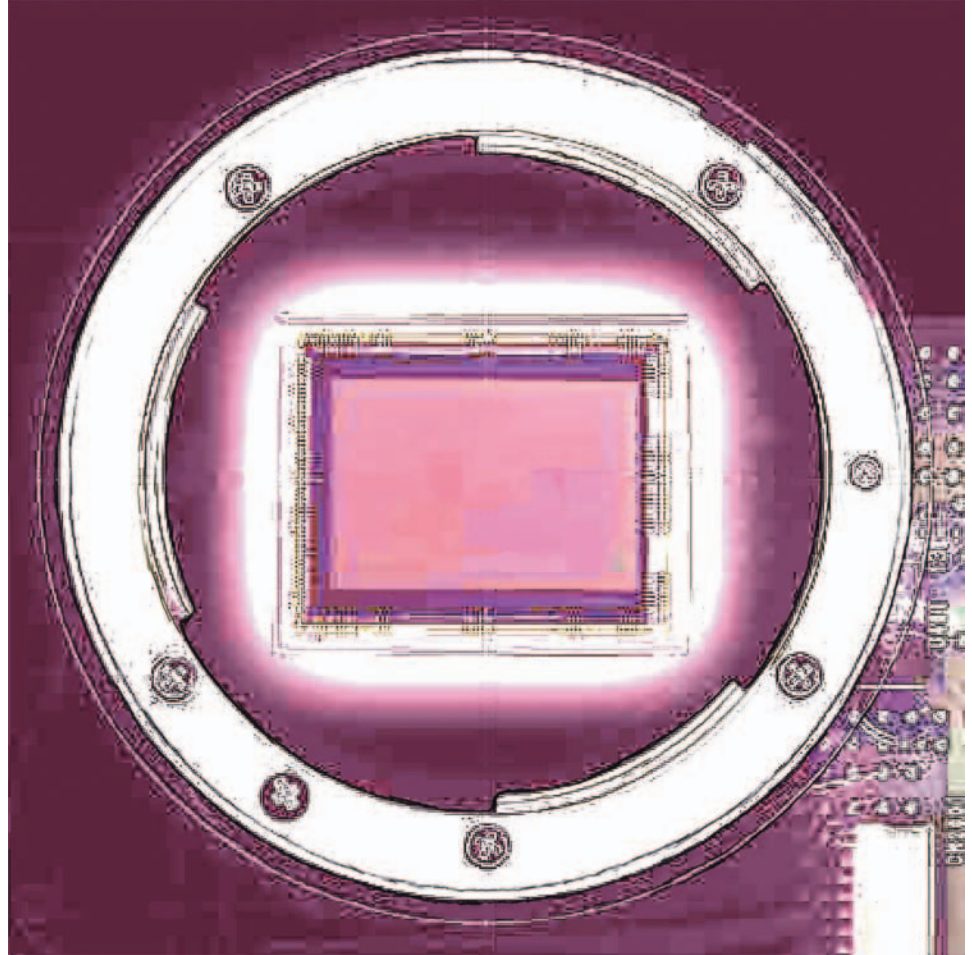
The 5:4 format is perfectly suited for prints that are 4" x 5", 8" x 10", 16" x 20", and so on. On the other hand 35mm has a 3:2 image ratio, producing prints that are larger than 5:4, such as 4" x 6", 8" x 12", and 16" x 24".

Half-Sized Sensors and Lenses

Because the sensor in most digital cameras is smaller than 35mm film, how the typical 35mm lens works on the camera can be a surprise to photographers who are used to what that lens does when they were shooting film.

What was once a 50mm lens is now effectively a 75mm lens. For those who have always wanted more powerful telephoto lenses, this is a great day. On the wide-angle side of optics, it can be a disappointment. *(Please see pages 96 & 97 for more on equivalent focal length.)* 🌸

...It's All About the Sensor



Hiding behind the lens and the mirror is the camera's sensor. It's the film of the dSLR camera.

Sensitivity: The ISO Equivalent

Gone are the days of loading that low-grain wonder, Kodachrome 25, into your camera for a day of bright light shooting, only to discover that when clouds swiftly overtake the sky halfway through the roll, you wished you had Ektachrome 400.

Some of us remember when film speed was expressed as ASA. It then became known as ISO, from the International Organization for Standardization's initials which are derived from the Greek word "isos" which means "equal." This represents the organization's efforts to provide standards worldwide.

In the digital environment, we still use ISO as a reference point when we talk about sensitivity. Not much has changed for ISO in the transition from light-sensitive materials to the effect that light has on the camera's sensors. The meaning of ISO 100 remains the same in either image recording medium.

Sensors Then and Now

Many digital single lens reflex (dSLR) cameras have a lowest possible sensitivity option of 200. This is three stops faster than the days of Kodachrome 25. It's also a full stop more than many cameras that go as low as 100. Just

as some clients would not accept film faster than ISO 100, the word on the street was that digital images must be shot at a sensitivity of 100.

The real issue for both film and digital had been "grain" (known in the digital world as "noise") and the belief that slower sensitivities delivered more accurate color, contrast, and image sharpness.

In 2007, the Nikon D3 changed all of that with noiseless, gorgeous images in the 200-6,400 sensitivity range.

Sensitivity's Role in the Exposure Trinity

The faster your sensitivity, the faster the shutter speed you can select. Similarly, the faster the sensitivity, the smaller the aperture you can choose, for greater depth of field.

On an overcast day, when you need all the shutter speed you can muster, a faster sensitivity is a dream come true. The same is applicable for when you are shooting with a long lens and need a terrific depth of field: bumping up your sensitivity is a big plus.

The beauty of a dSLR is that this adjustment can be accomplished on the fly. If the light changes, change your sensitivity to meet

your needs. However, it's not as much of a panacea as it sounds. There are upward limits to the sensitivity choices that you can make before your image becomes far too noisy. For some, this is a good thing. Noise has the appearance of grain in film. It's a great visual effect, especially in a fine art arena. For some, it's a sought-after creative means of expression. *(Please see the section on the next two pages, "Avoid the Noise; Enjoy the Grain.")*

Sensitivity Steps

Many brands of film are available in a series of one-step increments: 100, 200, 400, and so on. Some digital cameras work that way, too. The higher-end Nikon dSLR bodies allow you to choose full, half-step, or third-step increments.

Instead of just selecting 200 or 400, as you get in full-step mode, choose half-step. Then you can select 280, in between the two. In third-step mode 250 and 320 are available between 200 and 400. These step changes are available over the camera's complete sensitivity range. 🌸

ISO in Action: Choose the Proper Speed



The above photo was shot with the usual ISO 100 sensitivity setting that we normally use on a Nikon D2x, which gives us a shutter speed of 1/50 of a second, and f/4.0. There's just a minor amount of movement in the flame.



To freeze the flame's movement, we increased the shutter speed to 1/800 of a second and kept our volume of light to f/4.0. To compensate for that faster shutter speed, we had to bump our sensitivity to an ISO setting of 800.



We have increased the image size to 400% to examine the noise structure at the wick of the candle. Darker areas are where noise appears. There isn't much of anything to see, even when we zoom in, this tight. This is acceptable image quality.



When viewing our sensitivity setting of 800, zoomed in to 400%, we see noise that's considered to be unacceptable by higher commercial standards. A Nikon D3's sensor has larger pixel elements than the smaller sensor in the D2x and can shoot at higher ISOs.

Most cameras are not as advanced as the Nikon D3 when it comes to sensitivity and noise. In those cases you have to choose your battles. Every camera is different, but these may be your choices:

Low noise	100-200
Moderate noise	250-800
Extensive noise	1,000+

The Auto ISO Sensitivity Safety Net

Sometimes you have to bite the bullet and accept a sensitivity that's less than ideal. It's either that or lose the shot.

Nikon's Auto ISO Sensitivity feature is your safety net. It's available in Program or Aperture priority modes. (Please see page 85 for more on those options.) When this feature is on, the camera prevents you from over- or underexposing the image. It changes the sensitivity for you, to compensate. The photographer predetermines when this feature kicks in and what level of sensitivity is the maximum that is considered acceptable.

Because this feature only goes to work for you as a safety measure, it may not affect an entire shoot, just those moments when the light is too low or too intense. 🌸

Avoid Noise; Enjoy Grain

You can combat the noise that we discussed on the previous two pages in postproduction. Adobe Photoshop and Adobe Camera Raw have means of doing that, as covered in Chapter 6, “Raw Files and Scanned Films.”

Long-Exposure Noise

Noise can also come from long exposures. This is an electronic medium. Noise develops from static or an excessive electronic charge. Depending on the camera, this long-exposure noise can start at anywhere from 1/25 of a second to a second.

Managing noise is another example of how the dSLR has changed the way we work. Instead of waiting a couple hours after the morning test shots to examine the photo lab's rush results, we can check our test shots on the computer's screen in just a few minutes. Some of this can be dealt with through lighting changes.

Noise Reduction Camera Features

Many Nikon dSLRs can assist with the noise issue before you get to postproduction. This feature can be adjusted much like the Auto ISO Sensitivity options. When the conditions meet the threshold that you have predetermined, it automatically goes to work for you. Because the camera is doing some double

duty, you may notice a lag in processing time. Your camera has a buffer where the images are stored until they are saved to the memory card. While the noise reduction feature is processing, the buffer can get a little full.

This aspect of digital photography is another one that requires some careful testing. On some occasions the noise reduction feature may be perfect. At other times you might feel that the results are too soft.

In addition to long exposure, noise reduction is available for higher sensitivity settings, as well.

Too Noisy?

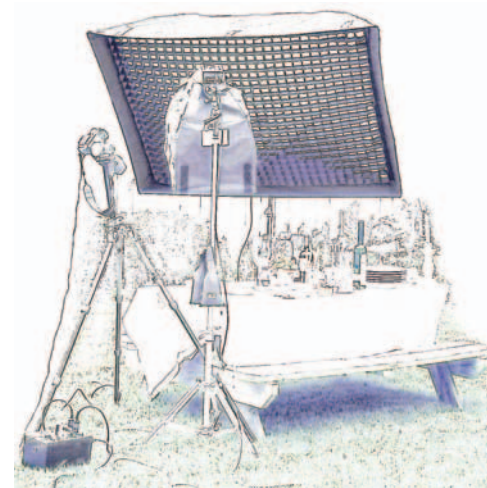
Noise does more than provide the look of film's clumps of silver halide grains. It can alter the image's rendition of color. Tonality tends toward more pastel-like characteristics. The rich, saturated hues appear absent from the photo.

The grain is cast in a central role of the photograph. It's like a prominent texture that runs throughout the image. It's so coarse that we cannot avoid it.

Photographers have enjoyed this grainy look in black and white images and have long resisted films that smoothed their beloved grainy appearances. It was the calling card of Kodak's Tri-X film for years.

Experiment with pushing the noise button. Find setups when grainy is beautiful and less saturated colors work for you.

This feature can be exciting for more than fine art. The grainy look is part of a photographic style that adds a little flare to a few very special wedding or portrait shots as well as having some head-turning commercial and editorial applications. 🌸



For motion, Brian relied on another extended exposure. Both Novatron flash heads fire in the Chimera banks, and the shutter remains open for a third of a second, opening the door to grain in another brilliantly styled set of Tracey Lee's creativity.



Volume of Light

Once called the camera's diaphragm, the aperture is to the camera what the iris is to our eyes. The aperture is the gatekeeper of the volume of light that is permitted back to the shutter curtains.

If you have not seen our analogy of the volume of light and its similarity to a water goblet being filled, on pages 64 & 65, please check it out now.

The volume of light that comes into the camera is the third component in the exposure trinity.

The choice of aperture changes the look of the entire photograph. At the maximum aperture, our depth of field can be dramatically limited on long telephoto lenses. The photographer has the power to limit what the audience can see.

In bright light, a wide aperture requires the shutter speed to react quickly.

The f Number System

No matter how long you have been in the photographic business, please take a moment to study the following mathematical progression of the f-stop numbers, below. Have you seen this before? Do you understand its significance?

$45 \cdot 32 \cdot 22 \cdot 16 \cdot 11 \cdot 8 \cdot 5.6 \cdot 4 \cdot 2.8 \cdot 2 \cdot 1.4$
1 2x 4x 8x 16x 32x 64x 128x 256x 512x 1,024x

For the most part, every other one of the f-stops halves the one before it from left to right, or doubles it from right to left.

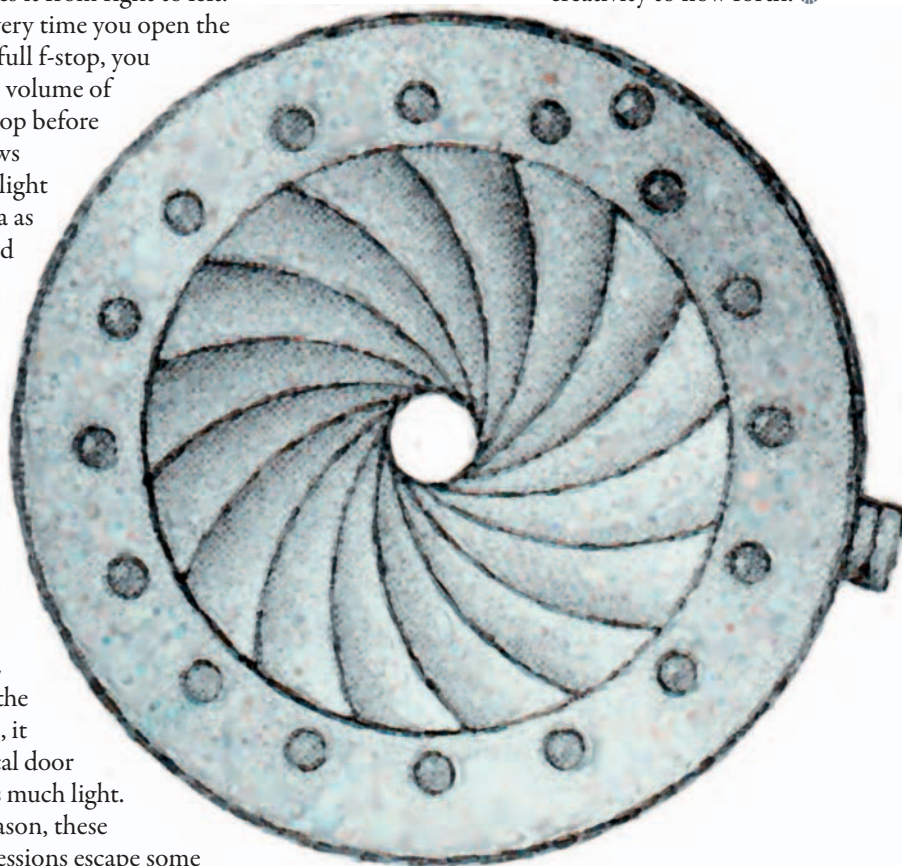
However, every time you open the lens one more full f-stop, you let in twice the volume of light as the f-stop before it. So $f/32$ allows twice as much light into the camera as $f/45$. Compared to $f/45$, $f/1.4$ admits 1,024 times the illumination.

As the aperture's circle is doubled, the area that it covers increases fourfold.

Though $f/22$ is roughly half the number of $f/45$, it opens the optical door to four times as much light.

For some reason, these numeric progressions escape some

of the most accomplished photographers. Understanding the technology allows the creativity to flow forth. 🌸



The Numbers on the Lens

There are a bunch of funny little numbers etched onto those Nikkor lenses. Some lenses have a little window with other numbers that can be seen in it. They're more prominent on the fixed-focal-length lenses than on some of the zooms.

Focal Plane Mark?

Let's start with the camera body. There's a funny circle on the body with a line going through it. That indicates precisely where the focal plane is located. On film cameras, this line tells you where the film is located. In a dSLR, the focal plane is the location of the camera's CMOS sensor.

Distance Scale

There's plenty of good information to be found and understood on two of the lens's scales. The distance scale indicates both meters (the white numbers) and feet (the yellow ones). Obviously, the distance to the far left of the scale is infinity. A helpful number is the one on the far right of that scale. It provides you with the minimum focusing distance of the lens.

A quick twist to the right of the focusing ring on our beloved AF-S VR Zoom-Nikkor

70-200mm *f*/2.8G IF-ED shows us 5 feet as the minimum focusing distance. If I want to shoot something that's 3 feet from the camera's focal plane, that number 5 just told me to not waste my time. It's the wrong lens for the job. It can't focus that close. (The tip of the lens hood would have been 1 foot, 11 inches from the subject, so it's obviously not what the lens was intended to do.)

Depth of Field Scale

An overlooked and extremely valuable scale is the one for depth of field.

Directly behind the distance scale is a white line, right in the center of the lens. It's the distance scale index line.



To the left and right of the index line are a few lines with f -numbers below them. This

is the depth of field scale; it shows you the zone of acceptable focus. It extends from in front of it to behind the plane that has the sharpest focus.

The depth of field scale tells us that if we set our AF Nikkor 28mm $f/2.8$ D to $f/22$, everything will be in focus from around an amazing 2.5 feet to infinity, if we adjust the focus correctly.

Reproduction Ratio Scale

Macro lenses have another valuable scale. The reproduction ratio scale tells us the relationship between the image that we capture



and the actual size of the subject. By way of example, something that has a reproduction ratio of 1:5 will record an image that's one fifth its actual size. 🌻

What Lenses Do to Light

Nikon's lens specifications note how many "elements" and "groups" their Nikkor lenses have. This tells us how many optical components are in the lenses. When they join together two or more elements, it's a group.

Efficient Light Transmission

Generally, the more glass that goes into a lens design, the more the light's rays will be met with resistance as they find their way to the sensor. The more resistance they encounter, the less efficient the lens becomes.

Knowing this helps in appreciating a lens like the AF Nikkor 85mm $f/1.4$ IF. This is an amazingly efficient lens. At $f/1.4$, the majority of the light that enters the lens makes it to the focal plane.

Telephoto Optics

Typically, a telephoto lens has light passing through a converging group of front

elements. The light rays are then influenced by a divergent rear lens element.

Nikon's very fast 85mm lens has nine elements in eight groups.

IF: Internal Focusing

In some lens designs, as you focus the lens, the lens barrel extends or retracts. This 85mm focuses internally (the "IF" lens designation), so the length of the lens remains constant. The lighter, faster lens group not only assists with focusing, but with efficiency as well.

Chromatic Aberration

When wavelengths of light pass through glass, each color is bent to a slightly different

degree. Each type of glass disperses light in its own way. Blue comes to a different position than red. This failure of colors to focus, in concert, is known as "chromatic aberration." Uncorrected, it produces a color fringing.

ED: Extra-Low Dispersion

Chromatic aberration is particularly noticeable with telephoto lenses. One way to deal with the problem is for designers to create lens elements that correct the aberration. Lenses made with calcium fluoride crystals are a popular solution, but they are prone to cracking and sensitive to temperature changes, which causes focusing problems.

To combat these issues, Nikon developed an extra low dispersion glass (hence, the "ED" that you see on lenses).

These ED lens elements (shown on the graphic, in yellow) keep the red, green, and blue wavelengths focused together.

All of the high-powered telephoto zooms that we use have the ED glass. Notice the graphic of the



The Letters on the Lens

lens elements and groups for our AF Zoom-Nikkor 80-200mm f/2.8D ED. Three of the sixteen elements have the extra-low-dispersion glass.

DX Format

Nikon's DX lenses responded to the need for optical solutions to their digital cameras that have half-sized sensors. The need is greatest in the wide-angle side of the family. *(Please see pages 74 & 75 for more on sensor size and pages 96 & 97 for more on equivalent focal length.)*



Wide-Angle Optics

Typically, a wide-angle lens is a retrofocus design. In other words, it's a telephoto lens in reverse. In part, it's why these lenses have such a compact form.

ASP: Aspherical Lens Elements and Coma

Just as telephoto lenses have inherent issues with chromatic aberration, wide-angle lens can have issues with coma (flare) and other kinds of lens distortion. These distorted images cause some photographers to be wary of wide-angle lenses, due to their past experiences.

The graphic of our AF Zoom-Nikkor 20–35mm f/2.8 shows the unique shape of that versatile wide zoom's distinctive first of fourteen elements (in cyan). It contributes to the lower weight of the lens. This aspherical element is crafted through precision grinding.

Another way to create an aspherical lens is in a molding process. The optical glass is softened by heating. It's then shaped in an aspherical glass mold.

Nikon additionally creates aspherical lens elements with hybrid resin molds. They inject a UV-curable resin between a spherical glass

lens and an aspherical metal mold. It's then irradiated with UV light, forming the lens.

AF and AF-S: Autofocusing

The AF lenses are designed for autofocus. There is a special silent wave motor (SWM) in these lenses for improved, silent, fast focus.

D: Distance

These lenses convey subject distance-to-camera information to the camera body. The camera then refines its exposure calculations.

VR: Vibration Reduction

Please see page 110 for more on how this feature reduces camera shake.

G: Gone?

Nikon's G designation is a sign of the times. Gone is the lens's aperture ring. Obviously even professional photographers are so digitally inclined now that they use their camera's subcommand dial to select aperture settings with third-stop accuracy. It has all the same attributes as the D lenses. 🌸

EV: Exposure Value

The exposure value (EV) system assigns one of twenty-three EV numbers to all combinations of popular shutter speed and aperture possibilities, running from $f/1.0$ to $f/45$ and 1/999 to more than sixty-eight hours. (No, we have never tried making an exposure that takes that long!)

The system then provides a set of circumstances where the twenty-three EV choices may be applicable to your needs.

We have provided the full chart of EV combinations as well as a portion of the possible applications. The applications are based on ISO 100. This system was developed in the 1950s. We cannot imagine owning a great DSLR, a terrific light meter, and using the table of applications. In the 1950s, most cameras were mechanical. The application chart was surely a valuable tool, then.

However, the EV combination table is still quite valuable now. EV is a mode on most quality light meters. By communicating that single EV number from the meter reading, you convey all the shutter speed and aperture combinations that are available.

To us, meter readings are all about making an informed decision and the EV concept encourages just that. (Please see Chapter 3, “Measuring Light and Color,” for more on using EV in metering.)

EV	f/1.0	f/1.4	f/2.0	f/2.8	f/4.0	f/5.6	f/8.0	f/11	f/16	f/22	f/32	f/45	f/64
-6	1'	2'	4'	8'	16'	32'	64'	128'	256'	512'	1,024'	2,048'	4,096'
-5	30"	1'	2'	4'	8'	16'	32'	64'	128'	256'	512'	1,024'	2,048'
-4	15"	30"	1'	2'	4'	8'	16'	32'	64'	128'	256'	512'	1,024'
-3	8"	15"	30"	1'	2'	4'	8'	16'	32'	64'	128'	256'	512'
-2	4"	8"	15"	30"	1'	2'	4'	8'	16'	32'	64'	128'	256'
-1	2"	4"	8"	15"	30"	1'	2'	4'	8'	16'	32'	64'	128'
0	1"	2"	4"	8"	15"	30"	1'	2'	4'	8'	16'	32'	64'
1	1/2	1"	2"	4"	8"	15"	30"	1'	2'	4'	8'	16'	32'
2	1/4	1/2	1"	2"	4"	8"	15"	30"	1'	2'	4'	8'	16'
3	1/8	1/4	1/2	1"	2"	4"	8"	15"	30"	1'	2'	4'	8'
4	1/15	1/8	1/4	1/2	1"	2"	4"	8"	15"	30"	1'	2'	4'
5	1/30	1/15	1/8	1/4	1/2	1"	2"	4"	8"	15"	30"	1'	2'
6	1/60	1/30	1/15	1/8	1/4	1/2	1"	2"	4"	8"	15"	30"	1'
7	1/125	1/60	1/30	1/15	1/8	1/4	1/2	1"	2"	4"	8"	15"	30"
8	1/250	1/125	1/60	1/30	1/15	1/8	1/4	1/2	1"	2"	4"	8"	15"
9	1/500	1/250	1/125	1/60	1/30	1/15	1/8	1/4	1/2	1"	2"	4"	8"
10	1/999	1/500	1/250	1/125	1/60	1/30	1/15	1/8	1/4	1/2	1"	2"	4"
11	0	1/999	1/500	1/250	1/125	1/60	1/30	1/15	1/8	1/4	1/2	1"	2"
12	0	0	1/999	1/500	1/250	1/125	1/60	1/30	1/15	1/8	1/4	1/2	1"
13	0	0	0	1/999	1/500	1/250	1/125	1/60	1/30	1/15	1/8	1/4	1/2
14		0	0	0	1/999	1/500	1/250	1/125	1/60	1/30	1/15	1/8	1/4
15			0	0	0	1/999	1/500	1/250	1/125	1/60	1/30	1/15	1/8
16				0	0	0	1/999	1/500	1/250	1/125	1/60	1/30	1/15

One second is indicated as ". One minute is '.

Autoexposure Settings

Generally, we discourage you from letting the camera do the thinking for you. Your Nikon digital single lens reflex (dSLR) camera is smart, but the images live in your mind, and it's up to you to interpret them.

However, once you have mastered what the automatic exposure options have to offer, you cannot only make it give you exactly what you want, but make it happen with greater speed and accuracy than you could ever do on your own.

It's your job to concentrate on the creative image-making and allow the camera to handle the technological minutia, at your direction.

P: Programmed Auto

Nikon has created an onboard exposure program that allows the camera to select both the aperture setting and the shutter speed. It's easy to get to. Just hold down the mode button while rotating the main command dial. A "P" appears in both the viewfinder and control panel.

On the next page we go into creative solutions for how you can take further control.

S: Shutter Priority Auto

The Shutter and Aperture Priority modes (see the following section) are the most valid options for the professional photographer. As with Program mode, rotate the command dial while holding the mode button, until you get an "S."

You make the judgment call as to what's the most important to you. Do you have your heart set on a fast shutter speed of around 1/2,000 of a second and will you take whatever aperture is available? Is a great blur, at a quarter of a second,

paramount in saying what you wish to photographically express?

Before you give yourself over to the camera, explore the results. Do some testing. Under the existing light, what aperture is your favorite shutter speed giving you? If you bump your speed a little in either direction, is the aperture that the camera's selecting more suitable for what you're after?

A: Aperture Priority Auto

After rotating the command dial while holding the mode button to get the "A," you must make a different set of decisions about depth of field.

Use Aperture Priority mode to make shutter speed choices. If you select the widest aperture that the lens has to offer, you'll get the fastest shutter speed that the camera can provide.

Again, please do some testing before you shoot. If all you're after is a fabulous depth of field, the obvious choice might seem to be the minimum aperture, but if that results in 1/8 of a second, are you risking unintentional subject blur? Is the depth of field so great that you now have distracting foreground and background clutter?

Please check out pages 87-89 to explore autoexposure options. 🌸



Camera Metering Methods

In-camera metering has improved dramatically over the years. Long ago, it was tough to trust what a camera's meter gave you.

If you have yet to learn how to use your camera's metering system fully, you may still feel frustration.

The high-end Nikon camera bodies have three metering modes.

3D RGB Color Matrix Meter

The most popular means of in-camera metering is using the color matrix. This method relies on a Nikkor lens with a CPU, its own little computer. The vast majority of the Nikkor lenses sold in recent years are compatible. They have the designations D, G, and AF-S, among others.

The lens's CPU sends information to the camera so that the meter is able to instantly gather information from 1,005 red, green, and blue sensors. This includes information on the subject's distance from the camera's focal plane.

The meter then analyzes lighting characteristics such as brightness and contrast. Each camera has an on-board database of 30,000 images, some of them challenging lighting situations. It compares your scene's incoming data to that of the image database.

The meter takes into consideration color factors of tonality, hue, and saturation, as

well as the lightest and darkest areas. It additionally factors in the autofocus choice that you have made before determining the proper exposure, based on the exposure mode you have chosen. *(Please see the previous page for more on autoexposure modes.)*

Center-Weighted Meter

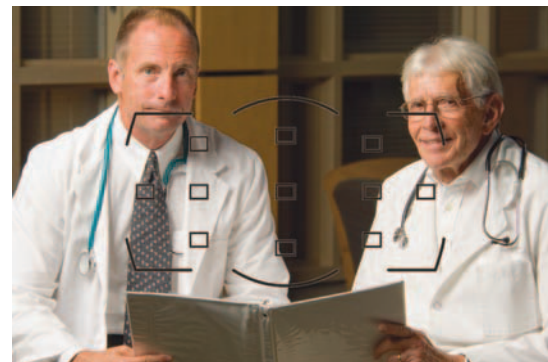
The most simple metering method is the center-weighted one. It considers the entire frame, but the majority of the metering assessment goes to what's directly in the center of the screen. Typically, that represents 75% of the metering determination.

Spot Metering

Working with a spot meter is challenging for some at first. It's coupled with your focusing selection. Most Nikon DSLRs have eleven focus points. The D3, D300, and D700 permit the selection of fifty-one or eleven focus points. This represents about 2% of the frame.

Whatever focus area is selected in the viewfinder becomes what the meter averages.

Extreme readings will result if the area inside the illuminated bracket is excessively bright or dark. 🌸



The above shows the eleven or fifty-one focusing points. Which ever you select, the important point is your comfort level, as a photographer. The use of the points, to navigate your way around the viewfinder, quickly, is essential to your creating excellent images, in that fraction of a second that they appear.

Exposure Locks

Carefully judge every shoot you do and analyze how it could have been better. If your exposure has let you down, what went wrong? How do you improve?

Refine your exposures with these functions:

Shutter Speed and Aperture Lock

On the D2x and D3 camera bodies, look to the top of the camera on the opposite side of the shutter release and control panel. There's an "L" button there. You can use this to lock your exposure while in Manual, Shutter Priority Auto, or Aperture Priority Auto modes.

To lock the shutter dial, hold the "L" and rotate the main control dial (the back one) just one click. An "L" will appear next to the shutter speed in the viewfinder and on the control panel.

You can lock the aperture in the same way, using the subcommand dial (the front one).

Unlock them the same way, too.

You can't lock Programmed Auto.

This option is great for when your subject remains stationary and the light remains the same, but you're moving around the subject. If all you care about is the light on one side of the subject, your exposure remains constant. The background illumination or the light from the other side of the subject doesn't affect your exposure.

It's a great sense of control and a terrific way to get exactly what you want.

Autoexposure Lock

Most Nikon camera bodies offer autoexposure lock. This option is slightly different than the shutter speed and aperture lock in the sense that it works only when the camera is in center-weighted or spot metering modes.

It's simple: frame up a well-exposed shot. Hold down the shutter release button half-way. Press the AE-L/AF-L button, and you're locked in.

This option doesn't work in manual mode.

Flexible Program

Programmed automation has some very professional attributes.

The exposure remains automated but you have the ability to change the shutter speed and aperture. It's also easy. As soon as you begin to rotate the main command dial (the one in back), an asterisk appears next to the "P." As you continue to rotate the dial notice how the shutter speed and aperture show different options.

Two-Button Reset

To return to the default mode, use the main command dial to find your way back to zero.

On top-of-the-line Nikon cameras, simultaneously hold down the WB and ISO buttons, for two seconds. Others use the QUAL and +/- buttons. This is a "two button reset" to return to the camera's various default settings. It's much like when you simultaneously hold down the Trash Can and Mode buttons until "For" blinks in the control panel, then let go and press them again, to reformat the memory card. 🌸



It's simple to lock in the auto exposure you want, and then recompose. Just hold down the above button.

Exposure Compensation

One of the quickest way to take exposure control into your own hands is just a fraction of an inch from the shutter release button.

The exposure compensation button is conveniently located for you to move your finger back, just a little bit, while you make fast changes on the main control dial with your thumb.

Exposure Compensation Button

This is the button with the “+” and “-” on it. When you move the main command dial (the one in back) this changes the exposure in third-stop increments. You can compensate for a total of five stops in either direction. Each time you move the dial to the right is -0.3 stops. Dialing to the left compensates +0.3 stops with each click.

You get visual confirmation in both the viewfinder and on the control panel. So it's possible to make these changes and remain informed about what's happening without ever taking your eye from the viewfinder.

Don't Forget to Reset

Once you have made these adjustments to the image, remember to reset the camera for no compensation. If you see that “+/-” in your viewfinder, you know that it's going to alter your exposure.

The exposure compensation button is ergonomically designed to sit notably lower than the shutter release button. However, if you get into the great habit of regularly using the compensation feature, you have to make sure, when you're in a hurry, you have to make sure that you're not accidentally changing your compensation.

I've Compensated How Much?

If you have forgotten how much you altered the compensation just tap the exposure compensation button; it's confirmed in both the viewfinder and on the control panel.

How Much Compensation Do I Need?

Don't let the compensation option become your crutch for making lousy exposures. Some photographers, including a few professional ones, are sure that using compensation guarantees their exposure. That's possibly true, but it may also be filled with false hope.

Through exposure compensation you can be sure you have the proper diffused specular. If the entire scene has such a wide dynamic range that some of the highlights are burning out or some of the shadow details are blocking up, you will not be able to compensate your way out of the problem.

Try to start with great exposure and then compensate a few clicks in either direction.

Scene Compensation

One of the best uses for exposure compensation is not manual bracketing (which is what we've been discussing). It's most effectively used when you know that there's something about the scene that will not expose exactly as you desire.

A great example is with high-key sessions shot on a white beach. It's possible that the sun's reflection on the sand is getting in the way of giving you the exact exposure you envision. That's when a general compensation is essential to ensure success. 🌞



Bring home the perfect exposure. Use the exposure compensation buttons whenever possible.

Bracketing Exposure

To understand where we are, we need to recall how we got here.

Nikon has given us a fast, powerful, efficient means of bracketing a photograph. What we used to do back in the “bad ol’ days” was manual bracketing: we’d set up and shoot the perfect shot and then cradle our left thumb and index finger on the aperture ring and make a half click to the right, shoot, another to the right, shoot again, get back to where we started, and do the same to the left, twice.

Types of Bracketing

High-end Nikon cameras offer three types of bracketing: exposure, flash, and white balance. None of the shots are taken until you say so, by releasing the shutter.

When to Bracket?

Bracketing is a terrific tool when you are in a situation where shooting and reviewing test shots cannot possibly fit into your time window of opportunity. This is especially important when you’re having doubts about whether the exposure is exactly where you want it.

Another great use of bracketing is when you’re doing those test shots. Knock off a few exposure and white balance brackets in either direction, for your careful examination later.

On the Menu

To choose the kind of bracketing you want (in this case, just exposure), go to the Custom Settings menu (the one with the pencil icon) and follow these steps with the Multi Selector’s right arrow (*the following menu numbers are different on some Nikon models*):

e Bracketing/flash
e5 Auto BKT set
AE AE only (choose OK)

Now, every time you use the bracketing button, you’ll be doing exposure bracketing, until you go back to the menu to change it.

The Bracket Button

This button marked with “BKT” is right above the “L” button on some Nikons, and it’s on the back of others.

Hold down the bracketing button and use the main command dial (the back one) to select how many shots you’d like the bracketing sequence to fire. With the bracketing button still depressed, use the sub-command dial (in front) to choose the exposure increments (0.3, 0.7, or 1.0). There are forty-eight different bracketing combinations, so browse through the options of third- and half-stop possibilities. Observe what the control panel is showing for options. Beside bracketing on

either side of the chosen exposure you can select just over- or underexposure. In addition to third-EV increments half- and full-stop choices are available, too.

Now, start shooting. Every time you release the shutter, the exposure value will change as you selected. On the control panel, you can observe the bracketing indicator disappear with each shot until the sequence has been completed, and then it will display all of them again.

To cancel bracketing, hold down the bracketing button again and rotate the main command dial until it shows no shots left in the sequence. ☼



Follow the directions on this page for setting up bracketing, then frequently bracket those important shots to be sure that your exposure is on the mark.

Manual Through-the-Lens Metering

You can't talk some people into autoexposure options. Some of these gifted folks have an innate sense for looking at a scene, glancing at what the meter is telling them, and then adjusting their shutter speed and aperture accordingly to what their eye is sensing and how their brain is creatively moving them.

For some, it's experience in action. For others, it's how they choose to control many aspects of their life.

In all cases, it's one of the better ways to explore how photographic exposure works.

It's Not Your Father's Through-the-Lens Meter.

First, if you have not read page 86 on camera metering methods, you need to do that right now and then return to this page.

Historically, through-the-lens (TTL) metering had been chronically disappointing. Today, the Nikon metering system is phenomenal.

Second, you need to acquaint yourself fully with the three metering options:

- 3D RGB Color Matrix Meter
- Center-Weighted Meter
- Spot Metering

M: Manual's Analog Exposure Display

Once you have held down the mode button and used the main command dial (the

back one) to choose the "M" for manual, the analog displays are your constant guide to selecting the proper exposure.

These displays appear on the control panel as well as in the viewfinder.

EV Increments from the Menu

You need to go to the menu and choose whether you want to see the exposure value increments in third, half, or full stops. Go to the Custom Settings menu (the pencil icon). Follow these steps with the Multi Selector's right arrow:

b Metering/exposure
b3 EV step
"OK" after choosing 1/3, 1/2, or 1 step

Optimal Exposure

When the display is showing just one bar in the center, you have chosen what the metering system has determined to be an on-the-money exposure choice, combining the shutter speed and aperture.

Overexposure

The more the bars to the left, the more the meter is telling you that you're risking overexposure for the scene. The meter shows exposure that is EV steps beyond what it has

determined to be appropriate for the exposure conditions based on its metering system. These are for you to determine.

Underexposure

The same is true for underexposure. If you have intuitively determined that a third stop darker is desirable, you make the correct choice for yourself.

Off the Charts

If the displays are flashing, the camera is telling you that the lighting conditions exceed what it is able to meter. You'll see this if you attempt to take a reading but have forgotten to take off the lens cap.

How Much Is Too Much?

Please use the samples, to the right to view the degrees of over- and underexposure that you may encounter and how a high-quality print material, like this book, responds. 🌸

The large image was photographed as metered. The smaller images are compensated by plus or minus one-third or two-thirds of a stop.



+ .03



+ .06



- .03



- .06



Depth of Field Expressions

The exposure trinity has everything to do with your ability to express your vision photographically. Mastering depth of field is dependent on your controlling the time value, sensitivity choices, and volume of the admitted illumination.

Exploring the Environment

Before you shoot, fully examine the photographic environment. Explore it with an open mind. If you've been shooting at the location before, pretend that you've never been there. If it's your own studio, set up your camera and lighting equipment somewhere new.

Pre-visualize

Now visualize the subject. Have in your mind how the subject is lit.

Having reintroduced yourself to the shooting environment, think about what is seen and what is unseen. Fully explore depth of field. We go into greater depth on these two exercises in Chapter 5, "Preproduction Smarts." For now, let's concentrate on expressing yourself with your choice of optics and how depth of field fulfills your vision.

What's in Your Camera Bag?

Many photographers shoot for years without ever interchanging the lens on their camera. The AF-S DX VR Zoom-Nikkor 18-200mm $f/3.5-5.6$ G IF-ED is one of those lenses that people start with, because it has such a broad focal length range.

The camera bag of photographers seeking glass that has a wider maximum aperture, may contain something like a Nikon D3 camera body, an AF-S DX Zoom-Nikkor 17-55mm $f/2.8$ G IF-ED to cover all wide to normal views, an AF-S Zoom-Nikkor 28-70mm $f/2.8$ IF-ED as a general purpose standard zoom, and an AF-S VR Zoom-Nikkor 70-200mm $f/2.8$ G IF-ED for telephoto situations. Excluding macro needs, a fast portrait lens, and maybe a teleconverter, they have covered the majority of the focal length requirements that will come their way, from 17-200mm, all with a maximum aperture of $f/2.8$.

Choosing the Glass that Says It Best

This sort of well-equipped photographer must consider which lens makes the visual statement for the shoot.

There's a direct correlation between depth of field and focal length. Just as you focus on a subject that is 5' away with an 85mm lens and open the aperture to $f/2.0$, your depth of field may only be a few inches. When you stop down to $f/16$, the depth of field increases to around a foot, and $f/5.6$ falls somewhere in between.

Now try the same middle ground situation of $f/5.6$ with focal lengths of 28mm, 85mm, and 200mm. On the telephoto side, at $f/5.6$, you may have a depth of field similar to what you had on the 85mm at $f/2.0$. However, with the 28mm, at $f/5.6$, your depth of field is around a couple feet.



Use the depth of field preview button, above, to pre-visualize what the aperture choices provide.

Distance from Subject Increases Depth of Field.

The further you are from your subject, the greater the depth of field will be, with any lens. If you need more depth of field, try pulling back. Revisit that same experiment with the three lens, but this time do it at 10'.

Depth of Field Preview Button

There may be a few buttons on your camera that are feeling a bit unloved. Is one of them the depth of field preview button?

There are two buttons on the front of your Nikon camera on the same side as the shutter release button. The one on the bottom is a special button to which a function can be assigned. The upper button allows you to preview what your depth of field is going to look like.

For the most part, when you look through the viewfinder, you're seeing the scene with the lens's aperture fully opened. The downside is that everything you see is at the minimum depth of field.

Set the camera's aperture to $f/16$. Focus on something close. Press the depth of field preview button while looking through the viewfinder. It does get a little dark, but you now have a visual confirmation of what the photo's depth of field will look like when you make the image.

That sound you hear is not a photo being made but the aperture closing down.

If you are using a Nikon SB-600, SB-800, or SB-900, the modeling light will come on when the depth of field preview button is used.

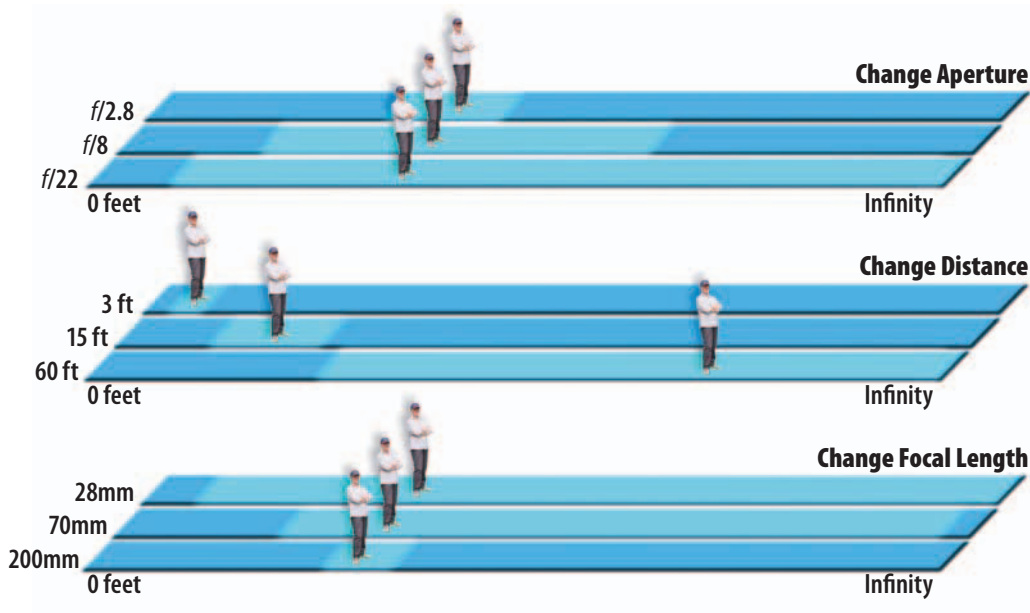
Make Better Creative Decisions

Use the depth of field preview tool often. It will fine-tune how you previsualize images in your mind, as well as how you think these

photos through when you scout your locations and explore the possibilities.

Experiment with different focal lengths. Get to know your optical toolbox better. Make it your goal to visualize depth of field and focal length as you plan a shoot.

Mix the following nine depth of field solutions, to gain the greatest variations in your photographic library. Let your versatility be seen by all. 🌀



Hyperfocal Distance = Maximizing Depth

We have been drilling into the core of depth of field and the role of the exposure trinity. On these two pages, we look at the best options for both maximizing and minimizing depth.

Hyperfocal Distance in Manual

In the final two pages of this chapter, we get into the power of manual focus and how all of that is relative to light.

Determining hyperfocal distance is a manual focus function. It is also one of the most powerful tools at a photographer's disposal. Additionally, it's rarely understood, discussed, or implemented by photographers who do this for a living.

On page 81 we got into how to use the depth of field scale of a lens. If you have not read that yet go there now and then come back here.

It's not practical for many lenses to have a depth of field scale today. Nikkor lenses continue to have them on their fixed-focal-length lenses. However, zooms have such a broad focal length range that those etched lines and numbers are not practical for those lenses.

Calculating Hyperfocal Distance

Just because the graphics are not etched into your lenses it doesn't prevent you from discovering the hyperfocal distance of any lens at any

focal length and utilizing the knowledge to expand your photographic projects' success.

Use this simple formula:

$$F \times 2 / f \times 0.033 = H$$

The capital F is the focal length. The aperture is represented by the lowercase *f*. The H is the resulting hyperfocal distance.

Use it this way: if you're shooting with an AF-S Zoom-Nikkor 28-70mm *f*/2.8 IF-ED at 50mm, multiply the focal length, 50, by itself and you have 2,500.

If you're thinking that the best aperture for the scene might be *f*/8, calculate 8 x 0.033 giving you 0.264.

Then, calculate 2,500/0.264 and the hyperfocal distance is 9,470mm or 9.47 meters, which equals 31.07 feet.

Don't think we're math wizards. We're not. We pop up the calculator on our laptop. It's easy to figure out. Quite honestly, if we're in the ballpark, we're happy.

The Field's Depth Is Where You Place It

Some say that the depth of field is centered upon the subject and runs the same distance into the foreground as it does into the background. That's a nice point of departure to teach what depth of field is all about, but the hyperfocal distance starts and ends at your

discretion. Once you have calculated your hyperfocal distance, don't place the center of your total available focusing zone on the subject, especially if that doesn't work for what you visualized.

How to Maximize

Maybe all of the foreground ought to be out of focus and there's a great background behind the subject that tells the story.

Could it be the other way around? The background is filled with clutter. Moving your hyperfocal distance forward makes the shot.

Lots of Room to Move

Part of the beauty of this manual focusing scheme is that the hyperfocal distance provides your subject so much available room to move that it's tough to be out of focus.

It's all about taking control and making the creative process as simple as possible, in your mind, as well as how you think these photos through when you scout your locations and explore the possibilities.

Less Is Better? Visual Economy

The digital photographer has so many options for maximizing depth. Sometimes that's the wrong way to go. The visual message becomes clouded by all the other goings-on.

Visual Economy

Writers are warned of “economy of verse,” using the minimal number of words to express the maximum thoughts.

Visual communicators can do the same. Create the maximum imagery impact with the most simple and direct photographs.

Maybe the long telephoto lens with a wide-open diaphragm takes your hyperfocal distance down to less than a foot, and that’s all you need to say about everything that needs to be said. 🌸

In this photo of Bill Lee and Grant Hagan, we kept our depth of field tight and our composition focused. Janet’s photograph drives the viewer’s attention to the models. Bill’s hand, on Grant’s chest, creates a rotating eye movement that makes it a visually appealing experience.



Equivalent Focal Length

Which lenses work on which digital cameras is ironically clarified by the optical term:

Circle of Confusion

This is also known as an image circle, the disk of confusion, a circle of indistinctness, and various other terms. To the photographic industry, it's a circular image that the lens delivers to the camera's focal plane. In most cases, it's more of an image than the camera needs.

In a 35mm film environment, the lens must provide a sharp image from the center of a 36mm x 24mm film plane to each corner of the frame. To do this, the circle of confusion must throw away a fair amount of its image.

Generally, the edges of these circles are soft. If that soft edge fell too close to the film plane, the result would be frame corners that are not even. When photographing an even blue sky, and the frame's corners are a darker blue than the blue in the middle of the photo, you have what's called "vignetting." It occurs more with some wide-angle lenses opened to full aperture. Technically, though, this happens to some degree with all lenses.

Lenses in the Digital World

The circle of confusion became a little more confusing with the introduction of digital single lens reflex (dSLR) cameras.

One of the many joys of the dSLR is how most of the Nikkor lenses, flashes, and accessories that photographers have collected over the years work on these new cameras. With the purchase of a dSLR, a photographer's digital career is off and running.

The Half-Size DX Sensor's Role

The jump from film to digital is not without a few peculiarities. Most dSLRs use an image sensor that's smaller than the 36mm x 24mm film plane. Until the introduction of the Nikon D3 in 2007, Nikon image sensors were in the vicinity of 23.7mm x 15.7mm, for their DX format.

Even more of the circle of confusion is lost on this new, half-sized sensor. As discussed elsewhere in this chapter, this change was a boom for everyone who wished their long telephoto lens were a little bit longer.

The 50% Factor of DX versus FX Formats

Nikon refers to its full-sized sensors as the FX format; they're about the same size as the 35mm film frame. To calculate the difference between FX and DX, multiply the 35mm lens's focal length by 1.5. Hence, a 200mm lens acts like a 300mm, when on a DX format camera.

The result of the conversion factor is known as the "35mm film equivalent focal length." Though it's exciting for telephoto opportunities, it's troublesome for wide-angle shots. That perfect 28mm lens is as good as a 42mm lens on a DX format camera. The 24mm lens that once provided dramatic, sweeping views becomes a 36mm wide-angle lens.

DX Lenses

To respond to this change, Nikon rolled out a bunch of fabulous DX lenses. Many of them were in the wide-angle ranges. They are specifically intended for use on DX format cameras. One of the added advantages of the DX lenses is that the circle of confusion could not only be smaller, but the overall size of the lens was now in a smaller, lighter form.

The downside of the DX lens is that if it's used on an FX format camera, the camera automatically switches to DX mode. Though that's convenient, the camera has no choice but to change from a full 4,256 x 2,382 pixels, which clients love, to a 2,784 x 1,848 pixels, which our clients will not accept. The reason for this is that the FX sensor has larger pixels than a DX sensor. The image quality of the FX sensor is astounding, but there are trade-offs, when using DX lenses.

If you really need an excuse for owning both a D3 and picking up a discontinued D2x, this is it. 🌸

Because the sensor is smaller in the DX format camera's (somewhere around 23.7mm x 15.7mm) only a smaller portion of the image is captured, compared to the FX format, which is closer to 35mm film, 36mm x 24mm.



Fisheye to Ultra-Wide Views

Super-wide views are considered to be in the range of a 16mm fisheye to 20mm ultra-wide.

Fisheye

There was a time when the fisheye lens created a unique round image, leaving the rest of the photo's frame in blackness. These fisheyes got to be as extreme as 7.5mm. Initially intended for scientific study, this was once called a "full sky" lens.

Today's fisheye lenses are full-frame, and at 16mm, these sometimes startling optics offer a spectacular 180° angle of view, much like a fish looking up at the water's surface. They cover everything from the ground to the sky above.

Working with the AF DX Fisheye-Nikkor 10.5mm *f*/2.8G ED, the 35mm equivalent of a 16mm lens, we get even image quality from center to edge to corner. The exposure coverage in one corner is as accurate as it is at the center.

It bends straight lines, both vertically and horizontally, creating what's known as a "fisheye effect." However, at the center, lines are predominately straight. Creatively, this makes a grand visual statement. What's at the foreground is huge and all of the composition's background becomes miniaturized.

The fisheye allows the photographer to provide the world with an image that cannot

be seen by the human visual experience. This lens compresses the world to a scale that we are unable to see ourselves. Through our own eyes, we gain a broad view, all at once. The depth of field is crisp over the vast majority of the photographic landscape. Its sharpness is practically as surreal as the image width.

When using this lens, you have to force yourself to think differently. Try positioning straight lines, such as horizons, at the center of the lens. Create different perspectives of the same scene by raising and lowering your camera height.

Ultra-Wide-Angle

The ultra-wide-angle lens is known for capturing those big landscape vistas. A 14mm lens has a 114° view. The angle of view on a 20mm lens is 94°. That's plenty of open space.

Using an AF-S DX Zoom Nikkor 12-24mm *f*/4G IF-ED and an AF-S DX Zoom Nikkor 17-55mm *f*/2.8G IF-ED, we seize opportunities to dramatize a moment. These big-view angles are great for small indoor groups (as to the right with Rebecca Crumb, Alexis Terry, Kaitlynn Connor, and Jacob Crumb). The expanse of the room is enlarged. The scale of the situation multiples in its perspective. What may have seemed ordinary suddenly takes on a greater importance.

The visual approach is so unique that it gets second looks.

Unlike with the fisheye, these are rectilinear optics: the straight lines appear as straight lines, not distorted ones. This makes the ultra-wide-angle lens an excellent choice for tight shooting spaces where the camera-to-subject distance is minimal. Direct views of architectural exteriors are without significant distortion concerns.

At 20mm, you cover about twice the view angle of a 50mm lens. That makes the ultra-wide superb for interiors. It offers an exceptional sense of spaciousness and depth.

Another nice thing about the 17-55mm is the *f*/2.8 maximum aperture. This offers an advantage for available light shooting. Because the angles are so wide, major concerns about depth of field do not exist.

Place the main subject in the foreground. It will dominate the action for maximum impact. Because the background has a greater sense of openness, the viewer feels pulled into the scene. The ultra-wide beckons the audience into what's happening.

Because so much is seen, the ultra-wide may need either a fair amount of even illumination or light that just focuses upon the foreground for a greater presentational effect. 🌸



The Wide-Angle Perspective

There's nothing normal about standard wide perspectives. These views generally run from a notably wide 24mm angle of view to 35mm, which some accept as their standard lens. Considering the digital (DX format) equivalent focal length of some of these lenses, discussed on pages 96 & 97, that puts them in the range of 36mm to 52.5mm to a full-sized sensor (FX format) or 35mm film camera.

For that reason, photographers shooting in DX format use ultra-wide lenses for the majority of their wide-angle needs. These standard wide-angle lenses are used as their normal lenses.

Instinctive Interpretation

Because the wide-angle perspective is not as extreme as the ultra-wide, there is not that feeling with the wide-angle view that it appears far beyond how the human mind processes a visual experience. These wide-angle views are disarming enough to depict a unique visual.

24mm: A Substantial Depth of Field

An advantage of the 24mm view is the ability to shoot quickly while maintaining an excellent depth of field. The image can favor foreground elements without losing its visual relationship with what appears in the photo's middle area. At times, what appears in the

background is not of great consequence, without becoming unrecognizable or insignificant to the viewer.

At 24mm, the photo has a feeling of depth. This is twice the view of a 35mm focal length. It's a popular angle for landscape and architectural applications.

28mm: Unexaggerated Perspective

Photographers have made the 28mm angle of view the workhorse of their wide-angle optics. As the look is less exaggerated than the 24mm or ultra-wide-angle lenses, the audience relates to it as being more normal, even though the amount of information that it takes in goes beyond what most eyes scan, at any given time.

35mm: Near-Normal Perspective

The least aggressive of all wide-angle views is in the 35mm range. Many photographers find this view as perfect for indoor shooting. The 63° angle encompasses a great deal of visual information. Most lines remain straight. Elements do not appear distorted. This is a great focal length for covering events like weddings or social occasions. The undistorted visuals provide pleasing renditions of the event's attendees while seeing plenty of the action. People in the background

do not appear dwarfed in relation to the foreground's subjects. 35mm is considered a moderate view.

Lighting for Wide-Angle Shots

Though we occasionally enjoy the lightweight AF Nikkor 28mm f/2.8 D, most of our wide shots are captured with the compact AF Zoom-Nikkor 20-35mm f/2.8. The more all-purpose oriented lenses like the AF-S Zoom-Nikkor 28-70mm f/2.8 IF-ED and the AF-S VR Zoom-Nikkor 24-120mm f/3.5-5.6G IF-ED are great choices when we may not be able to interchange a lens, at the risk of losing a once-in-a-lifetime situation.

Lighting for wide-angle views is not as daunting an experience as the ultra-wide views. Obviously, the wider the angle of view, the more square footage of space must be illuminated.

Many sophisticated flash units such as most Nikon Autofocus Speedlights adjust their spread of light to match a lens's angle of view, for maximum efficiency.

When lighting with digital studio flash or continuous light sources, the more square footage that you need to cover, the more power you will need at your disposal. 🌸

Brian photographed James Harrison, Joe Reyes, Sherrie Hagan, and Jil Wilson Robinson with an AF-S Zoom-Nikkor 28-70mm f/2.8 IF-ED @ 38mm.



What's Optically Normal?

When a fixed focal length lens came with many film SLR cameras, something around 50mm was the standard choice. Today, even entry-level digital SLRs come with a zoom lens such as an 18-55mm. The 35mm film equivalent of those focal lengths work out to 27-83mm, an excellent moderate wide to moderate telephoto range.

Available Light Considerations

Many professional photographers, who work with ambient light prefer a wider maximum aperture than $f/4.5$. When working in low light, $f/2.8$ is preferred by many photographers. For that reason, we love the AF-S Zoom-Nikkor 28-70mm $f/2.8$ IF-ED, as our standard lens. It's quite a bit of gorgeous glass to carry around.

Fixed-Aperture Lenses

When working with a camera's built-in metering system, variable-aperture lenses are no problem. As the lens zooms in and out, the aperture varies over a range of something as broad as $f/3.5$ to $f/5.6$, when the aperture is wide open. The camera automatically adapts to this range of over one full f -stop, without the photographer needing to be concerned about the changes.

However, when taking manual meter readings (which we discuss in the next chapter) or when using digital studio flash (which is fully explored in Chapter 13, "Digital Studio Flash"), photographers are not comfortable with those sort of variables. They choose a fixed-aperture lens for those kinds of photographic projects. This is where you usually find the more extensive front-end glass that's often an impressive 72mm wide.

Brian photographed model/actress Kelly Hoelscher (right) with a AF-S Zoom-Nikkor 28-70mm $f/2.8$ IF-ED in a conservatory using digital studio flash. The fixed aperture was imperative for reliable exposure.

The Optical Signature of Human Vision

The standard focal length does not have the optical signature of its wide-angle or telephoto siblings. It's free of the distortion or compression associated with those lenses.

At 50mm, you create images that remain fairly faithful to what the human eye typically encounters daily.

As discussed on pages 22 & 23, what our eye sees and how our brain compensates makes it difficult to typify human sight. Our minds are able to rivet our concentration on a tight field of view, much like a tunnel effect. This happens without the characteristics of

photographic lenses. Equally, our eye-mind coordination can take in a peripheral view.

For the most part, the 50mm focal length best represents how we see and the audience for your photographic expressions can identify with that 46° angle of view.

Keeping that in mind assists the photographer in the creative process.

Camera to Subject Distance

If you like what 50mm does for the photograph, forget zooming at that moment. Explore what happens as you adjust your distance to your subject.

The closer you get to someone, the more your distant background falls out of focus, selectively directing attention to the human face, much like the brain adapts. At greater distances, the depth of field at 50mm takes in much of everything.

Artificial Lighting

Because the angle of view is limited to 46° , the 50mm focal length does not demand as much artificial illumination as a wide-angle lens.

An on-camera flash works with greater efficiency. For studio flash and continuous light, such as the systems we discuss in Chapter 11, "HMI," fewer instruments are needed. 🌟



The “Fast” Lens

It's difficult to categorize a “fast” lens. The term is part of our photographic jargon, rather than a term rooted in technical origin.

In general, it refers to an impressive maximum aperture that allows more light to reach the camera's sensor.

Low-Light, Fast Action

Any photographer working with fast action appreciates a fast lens.

We photograph many staged shoots with children. Those of us who do this will concur that fast action is not limited to sporting events.

Low-light situations demand an aperture of at least $f/2.8$. Another stop of $f/2.0$ or even $f/1.4$ is greatly appreciated when the available light is at a premium.

Freezing Action

The wider the aperture, the faster the possible shutter speed. Freezing fast-moving subjects can require a shutter speed as fast as $1/4,000$ of a second. Under some lighting conditions, that's tough.

Shallow Depth of Field Commonality

Our favorite super-fast lens is the AF Nikkor 85mm $f/1.4D$ IF. It's not only fast, but at that maximum aperture, it delivers a shallow depth of field. Many fast lenses share that

distinction. For the versatile photographer, the fast lens wears many hats.

Wide-aperture telephoto lenses have such shallow depths of field that the viewer's attention can be focused on just a small segment of the subject. Everything else has that beautiful softness to it.

Again, in some ways it is beyond human visual normalcy, but at other times, it represents how our eye-mind coordination works to hone our attention upon a microcosm of our existence. For a parent or anyone who loves another so much, that almost unreal, shallow depth of field on someone's eye is exactly how we focus our attention upon a loved one's cherished feature.

Cost-Effective

Generally, this “big glass” costs a little more. We have an investment ceiling of \$1,500 on any lens. As impressive as they are optically, Nikkor lenses are more cost-effective than some of their competitors.

For any professional photographer, optics must have the same return on investment as a camera body, computer product, printer, lighting product, or anything else that we use in our business. If the fast lens costs a few more dollars but allows us to create more sellable images, it easily pays for itself.

Slow Action

On occasion, the fast lens is great for some images that take almost a full second to record. That's where that wide aperture comes into play. An $f/1.4$ lens that requires a shutter to remain open for $1/60$ of a second would need a quarter of a second with a lens that has a maximum aperture of $f/5.6$. At a shutter speed like that, the shot could be lost.

Very Little Light

For many of these fast lenses, not much artificial light is needed. In these situations, flash units can recycle very fast, knocking out a few images per second. They are perfect for fashion or any people shots where you don't want a single possibility to get away.

The smaller continuous-light instruments that we love can service your needs like their monstrous, unaffordable counterparts do for some not-so-fast lenses.

Besides the AF Nikkor 85mm $f/1.4D$ IF (used to photograph Domenic Scotty, right), our other favorite, fast lenses include the AF-S VR Zoom-Nikkor 70-200mm $f/2.8G$ IF-ED, the AF Zoom-Nikkor 80-200mm $f/2.8D$ ED, the discontinued AF Zoom-Nikkor 35-70mm $f/2.8$, and, of course, the AF-S Zoom-Nikkor 28-70mm $f/2.8$ IF-ED. 🌸



The “Portrait” Lens

Many photographers swear that an 85mm lens is the perfect portrait lens. We agree. With a 29° angle of view, it is notably more narrow than the 50mm focal length.

Besides great portraits, this angle of view is fantastic for all sorts of subjects, including still-life photos.

Facial Proportions

Wide-angle lenses and even a standard focal length can distort some facial features. Ears and noses looking out of proportion is very unattractive. 85mm has just a moderate amount of compression.

Closeness to Subject

Some subjects, including some very experienced models, need a warm-up period. Others, who are rarely in front of the camera, can feel ill at ease in the most comfortable studio or their own home. Give your subject some space. An 85mm lens permits this. You're close enough to chat with the subject, but remain out of sight.

In a well-lit sitting, the photographer and any crew are behind the lights. With time, the subject forgets that the camera is there and the magic of the session starts to happen. Soon a comfort level develops and everyone starts to have a good time and feel very posi-

tive about themselves and the photographic session. The greater the synergy, the better the image-making results.

35mm Film Equivalent and Beyond

In DX mode, a 57mm focal length is the approximate twin of an 85mm lens.

As mentioned in the previous two pages, our favorite super-fast lens is the AF Nikkor 85mm *f*/1.4D IF. On a DX camera, that's a film equivalent of a 127.5mm focal length.

Some profess that 105mm is a great portrait lens, too, but 135mm is too compressed. On a camera with either a full sensor or a smaller DX sensor, the 85mm is superb.

Our 85mm *f*/1.4 has a special rounded diaphragm so that sparkling out-of-focus elements look more natural.

Zooms for Portraiture

In a well-tested studio environment or with a lighting setup that has gone to many locations, a fixed-focal-length lens is an old, comfortable companion.

Other times, a zoom offers those minor adjustments to pull in or out as a subject moves about a setup and you get to remain stationary. The optics we mentioned, in the previous two pages, are time-tested by us for portrait shots:

- ☛ 28-70mm *f*/2.8
- ☛ 35-70mm *f*/2.8
- ☛ 70-200mm *f*/2.8
- ☛ 80-200mm *f*/2.8

An important aspect of these optics are their very wide apertures and possible shallow depth of field.

The beauty of the portrait lens is the ability to sometimes limit the focus from nose to ear. We have no hard and fast rules on this. The best focal range varies from person to person.

Outdoor Portraits

All of the above could change once you move outdoors. Even in a primarily controlled outdoor portrait studio, there are surrounding elements that are best thrown out of focus for some, but work excellently for others. What's terrific for one subject at 85mm is absolutely breathtaking at 600mm for another.

This is where your own creative genius kicks in and you master your optical tools, seeing the possibilities in your mind's eye, before your eye looks into the viewfinder. 🌸

*Brian photographed Becca Bilger (right) with an AF Nikkor 85mm *f*/1.4D IF @ *f*/13 for 1/125 of a second on a Nikon D2x. The flash light source was a Novatron Bare Tube Head in a Westcott 60" umbrella.*



Telephoto Compression

Pulling in distant objects is what most of us think about when we mount a telephoto lens. We customarily associate telephoto with sports. On a deeper level, it's all about the optical results. Telephoto lenses have a visual voice of their own.

Traditionally, standard telephoto optics run from the shorter 60mm focal lengths all the way out to 300mm, which would seem like ultra-telephoto to some.

Working much like a telescope, these lenses have been designed with an optical system that keeps the physical length and weight remarkably compact.

Compression

One of the most notable characteristics of the telephoto lens is how it compresses everything that it images. It is very much the opposite effect of the wide-angle lens that adds a feeling of depth.

As you zoom in on a subject, the compression of perspective increases. This becomes most apparent once the angle of view has been narrowed to 135mm and beyond.

Distance from Subject

The telephoto lens sometimes give photographers a sense that they are on a spy mission. The subjects can be unaware that they are be-

ing photographed. This has advantages with subjects who like plenty of space to perform.

Directing talent with a longer focal length can also present some challenges. It can feel like you are yelling at the talent rather than directing them. This can be distracting, but it provides an opportunity to get out from behind the camera and gently work out strategies with the models. Use these situations to allow your models to feel like this is a collaborative effort.

We have also enjoyed some very successful sessions where a trusted talent coordinator was close to the models and directed them while we were shooting. That's another advantage of telephoto: a director can be just a few feet away but unnoticed by the camera.

Cameras with Smaller Sensors

We love the discontinued Nikon D2x camera body. With its less-than-full-sized sensor, telephoto views are 50% closer. When we zoom to 200mm, the 35mm equivalent that we are actually capturing is 300mm. Janet captured Cami Beaver (right) at 330mm with a D2x.

Our AF Zoom-Nikkor 80-200mm f/2.8D ED is effectively a 120-300mm, just as an AF-S VR Zoom-Nikkor 70-200mm f/2.8G IF-ED provides fabulous 105-300mm photographs when mounted on any DX format Nikon camera body.

Tripod Mounting for Horizontal or Vertical

These longer lenses have a little weight to them. The steadiest images, at long lengths, require you to secure the lens to the tripod rather than the camera body.

This has advantages. Lenses like the AF-S VR Zoom-Nikkor 70-200mm f/2.8G IF-ED have a specially designed tripod mount that permits you to quickly rotate the lens and camera 90°. You can grab horizontals and within seconds shoot verticals. Along with variations of focal length and camera angle, this ability dramatically increases your photographic yield on a shoot. The more great images that you have created by the end of the day, the more creative and financial success you will realize.

Lighting for Telephoto

With angles of view as tight as 8° on these standard telephoto lenses, a huge number of lighting instruments are not required. The area you are filling is limited. However, when shooting outdoors, your fill flash needs to take on the intensity of the sun. This can require a great deal of flash power. As you'll see in Chapter 8, "Man-Made Modifiers," we use reflector materials, whenever possible, to harness as much existing light as we can. 🌸



The Ultra-Telephoto Eye

The view from 900mm is absolutely breathtaking, under the control of the creative eye. Much like the extreme view of the ultra-wide-angle lens, the ultra-telephoto offers your audience a visual feast beyond what their eyes can achieve naturally.

We think of these long lenses for the adventures of an African safari, but these stunning views know few boundaries. It's your job as an accomplished photographer to find new ways to showcase what has yet to be seen.

Whether you are shooting flowers or fashion, the extraordinary optical compression of the ultra-telephoto directs the viewers' attention to just a few feet of depth. Everything in the foreground and everything in the background does not matter. These long lengths say, "Look here!"

The Digital Camera Advantage

The ultra-telephoto lens makes owning a DX camera body a joyful investment. When we're shooting with the already awesome AF Zoom-Nikkor 80-400mm *f*/4.5-5.6D ED, we're actually photographing with a 120-600mm, when mounted on a Nikon D2x camera body.

In the same way, the AF-S Nikkor 300mm *f*/4D IF-ED becomes a 450mm lens with its fixed focal length and aperture.

Teleconverters for Twice the Focal Length

You can place a teleconverter between the camera body and the lens. This provides 1.4x, 1.7x, or 2x the telephoto power.

With a Nikon AF-S Teleconverter TC-20E II the AF-S Nikkor 300mm *f*/4D IF-ED doubles in focal length to 600mm. In DX mode it is a 900mm.

Because light must pass through additional elements of glass, the 1.4x reduces light transmission by 1 stop, as the 2x reduces it by 2 stops. Full aperture metering is possible and the autofocus feature works with compatible Nikon camera bodies.

Nikon recommends these teleconverters for use only on specific Nikkor lenses. For many photographers this is an extremely cost-effective solution for getting the most from lens investments.

Tripod Mounting

It's highly unlikely that you can hand-hold a camera with an ultra-telephoto lens for an extended period of time. The weight of the camera system is an important consideration. The stressful effect on your muscular and skeletal systems must be given your top priority.

Even while hand-holding one of these very powerful optical rigs for a brief period of time, you'll need a very fast shutter speed

to be able to obtain sharp images. A rule of thumb to determine how long you can effectively hand-hold is to convert the focal length to a shutter speed. For a 900mm lens you would need to shoot at 1/1,000 of a second.

In this situation, a good, strong tripod is absolutely essential.

Vibration Reduction

Even with great tripod support, factors such as wind and vibration threaten the stability of your setup. Here's where a lens with vibration reduction is worth the investment.

The Nikkor lenses with "VR" in their model name have vibration reduction. It can be switched on and off to reduce battery power consumption.

The results are similar to shooting with a shutter speed that's three times faster.

It can be activated for either the image plane, the viewfinder, or both. These options not only result in sharper images but, it reduces eye strain as well. 🌸

At a DX format of 900mm Brian gives us a very compressed, close-up look at Michelle Shea. Though she's in excellent focus, the fence is so compressed that it's distorted. The depth of field is quite limited. All of this adds to the visual enjoyment, driving our eyes only to Michelle.



Macro Vantage

There's something so awe-inspiring about seeing a 17" x 25.5" image roll out of our Epson printer with an extreme close-up of a bee digging around in a flower's blossom. The image is many times larger than life.

As photographers, we have the honor of showing people wildlife on a far grander scale than they can see it themselves. We place nature on exhibit with more detail than the human eye can detect. Tiny things that people walk past daily and never notice now gain their deep admiration.

The macro vantage point is all about how close can you get. The closer you get, and the bigger the print, the more attention you grab.

Even some of the most rushed and frazzled passers-by glance at a big, colorful print of a tiny world on exhibit.

The Best Lens

We shoot our macro images with three different lenses:

- AF Micro-Nikkor 60mm *f*/2.8D
- AF Micro-Nikkor 105mm *f*/2.8D
- Micro-Nikkor 200mm *f*/4 IF

Each lens has a specific look and use.

Once we got a feel for each lens's strengths and the optical statement that they could announce, loud and clear, it became easy to choose the best lens for the job. Over time,

you get to know the optical tools in your toolbox, just as a woodworker knows the tools of his or her craft.

60mm Macro

This is a fabulous lens for small-product photography. Just like a standard 50mm focal length, it is free from wide-angle distortion or telephoto compression. This macro lens is the best choice for a visual experience that's similar to what the human eye images daily. The only difference is that with this macro, you can get into a minimum focusing distance of just 8".

Depth of Field and Plenty of Light

When you get down to very close focusing distances, the depth of field becomes quite shallow. You can use this to your advantage, as both of the autofocus Micro-Nikkors have a maximum aperture of *f*/2.8.

Because all three of these Micro-Nikkors have a minimum aperture of *f*/32, an extensive depth of field is possible, with sufficient illumination. Because the subjects that you are capturing in this fascinating macro world are so small, plenty of artificial light can be created at a minimum expense and without much size, weight, or transportation issues. How you choose to document these small

subjects with depth of field is part of your photographic style.

105mm Macro

With a minimum focusing distance of a foot and a half (the newer ones get in to just one foot), a 105mm macro makes a notable visual statement possible.

Because this is a very capable autofocus lens, the photographer can work quickly. You may only have a few seconds to shoot that butterfly with the exact wingspan position before it's gone for good.

Knowing where to focus is paramount. Understanding the lens's depth of field, too, can make the difference between getting exactly what you came to photograph and going home with less-than superb results.

200mm Macro

As many images as we have made with this lens, we still delight even ourselves.

With an angle of view of just 12° and a minimum focusing distance of a remarkable 2.34 feet, what we photograph is nothing less than mind-boggling.

Because getting this close is tough to successfully hand-hold, the lightweight but rugged Gitzo Mountaineer tripod allows us to move about swiftly outdoors. 🌸



Bending Light, Bending Objects

Before the resolution of a Nikon D2x came to be, clients looking for big images required that we shoot with view cameras, an updated version of the nineteenth-century camera that used photographic plates. These large cameras, with a front standard for the lens board, a rear standard for the film holder plus a focusing screen, and a bellows in between, used 4" x 5" or 8" x 10" sheets of film.

As the standards tilt and swing, the perspective of a building can be straightened out to appear as if you are looking directly at the center of the structure, rather than from the ground. The same is true for photographing products in the studio. The lens delivers an ample "circle of confusion" upon the film plane, permitting the rear standard to pick and choose which portion of the image to use.

Perspective Control and Macro Lens Magic

The PC Micro-Nikkor 85mm $f/2.8D$ performs some of the perspective control magic of a view camera plus has macro capabilities. This has a minimum focusing distance of only 16 inches. The actual image that it captures is half-lifesize, holding great detail, at a maximum reproduction ratio of 1:2.

This lens is perfect for product photography. With a minimum aperture of $f/45$, it has the minor optical compression of a moder-

ate telephoto lens, but an exceptionally deep depth of field when fully stopped down.

These features also makes it an excellent choice for copying large works of art. You are able to swing and tilt the lens so that everything squares up perfectly, without the need to shoot from a ladder.

Landscape photographers can enjoy the lens's swings and tilts to enhance foregrounds.

For architectural and interior photographers, Nikon has a wide-angle companion to this: the PC-E Nikkor 24mm $f/3.5D$ ED.

Shifting

The lens shifts up and down or left and right, which allows you to:

- Remove unwanted objects from the image



- Correct perspective
- Move the camera to avoid unwanted reflections and adjusting the shift as if you never moved
- Adjust the focal plane to achieve full focus over a subject plane that is not parallel
- Adjust the focus on a specific part of a subject without changing the aperture

Tilting

This function allows you to bring clear focus to the entire subject plane without the subject



being parallel to the film plane. Just like with a view camera, you can use the tilt and shift

controls simultaneously to alter the perspective and shift the focus.

Revolving

The entire lens can also be revolved up to 90°, left and right, which permits the shift function to operate vertically and the tilt function to be used horizontally. 🌸



The stained glass window to the right was easy to correct for the keystone effect that is caused when looking upward at a tall plane. The perspective control lens offers all that is needed for this.



Balancing Light to White

As we covered on pages 12-24, light has an amazing array of color attributes. What our eyes and brain do with the color information they receive permits a great deal of adaptation from how the color of light is altering the appearance of the subject.

With a film camera, we can filter the light coming into the lens and balance for daylight or tungsten films. This adjustment often requires opening the aperture further to compensate, which usually causes its own set of frustrations.

In some situations, we can change the color of the light, as we cover in Chapter 8, “Man-Made Modifiers.”

Amazingly, the digital camera provides us with some of the capabilities of the human brain, automatically adjusting color temperature, if that’s what we want. This and the many manual adjustments and preset options constitute “white balancing.”

The Digital Filters

White balancing is like a set of digital filters. In a yellow light, the color temperature is below 5,500 K. A white shirt appears yellow, but balanced, with a little blue, it’s back to white. *(Please see pages 16 & 17 for more on the Kelvin scale.)*

In a cool light, the color temperature is above 5,500 K. Our white shirt appears bluish to the camera. However, once the camera adds a little yellow, we record it as the kind of white it should be.

Once the whites are white, the rest of the colors fall in line.

Of course, balancing to white is not always the desired effect. The color of light provides photographic moods, sometimes when the moods do not exist. The white balancing options can create the moods for us. *(Please see the next two pages on white balancing and mood.)*

White Balancing Now or Later?

Some photographer’s ignore white balancing in the camera. They know they can deal with it later, when they process their image with Adobe Camera Raw. *(Please see Chapter 6, “Raw Files and Scanned Films,” for more on this.)*

We, however, always choose our color temperature when we’re shooting. We know the feeling that we’re attempting to achieve at the moment we are creating the image. It’s not unusual for us to shoot a few thousand images in a day. Many of the details of the shoot are embedded in our minds for many years. However, a few slip by.

Some photographers, especially those in the wedding side of the business, do not shoot raw files. They go right to JPEG files and send them off to the lab that way, just like they were still shooting film. Not only does their white balancing need to be on the mark but so does their exposure.

Their thinking is that time is money and any time put into processing raw files is money wasted.

Auto White Balance

When shooting in natural light, some allow the camera to set the white balance for them. Your Nikon DSLR can do this over a range of 3,500-8,000 K. The camera’s image sensor, RGB sensor, and sometimes the ambient light sensor do the readings for you. When you are using certain Nikon Speedlight instruments, it adjusts accordingly for them, too. However, that would not be true when using digital studio flash systems.

Menu Option White Balancing

The latest Nikon DSLRs come with the following white balancing options on the cam-

era's menu. These are good quick solutions that fit the needs of many photographers:

Incandescent	3,000 K
Sodium Vapor	2,700 K
White Fluorescent	3,700 K
Cool-White Fluorescent	4,200 K
Day White Fluorescent	5,000 K
Daylight Fluorescent	6,500 K
High Temp Mercury Vapor	7,200 K
Direct Sunlight	5,200 K
Flash	5,400 K
Cloudy	6,000 K
Shade	8,000 K

These are also excellent starting points for fine-tuning white balance. *(Please see the next page for more on fine tuning.)*

Manually Setting Color Temperature

When working with a color meter, you'll want to choose the color temperature yourself.

We use the Gossen Color-Pro 3F. It's sometimes easier for us to take readings with the meter and then input them into the cameras. By way of example, knowing that a

cloudy day can be variable, when we shoot we gather as much information as possible and make informed decisions. *(Please see the next chapter for more on this.)*

Direct Camera Measurement

Another great means of customizing your white balance is to use a gray card and take a reading using the camera's sensors.

We use the Lastolite 30" Ezybalance Grey/White Card. It's a big enough target to get a great reading.

It's easy. Hold the camera's WB button and rotate the camera's main command dial until PRE appears in the viewfinder or rear control panel. Release the WB button and then press it again. PRE will start to flash. Hold the gray card where the subject will be photographed so that the 30" card fills the frame. Then press the shutter release, completely. No photo is taken. The camera doesn't even need to be in focus. The white balance is recorded and stored on the camera's WB preset menu as d-0. "Good" will flash on the control panels. If the illumination is too dark or bright, to get a good reading "noGd" flashes instead.

Up to four of these readings can be copied and stored along the comments.

Copying White Balance from a Photo

You can also copy and store white balances from up to four photos. The photos come from images on a memory card. 🌸



There's power in the camera's white balance button. Read the full text, on these two pages, for all you can do with it.

The Color Moods of White Balancing

On occasion, the color temperature that we wish to capture just doesn't exist right there in front of us; it's all hiding in the creative regions of our minds.

One of the many beauties of digital photography is that we can create a warm light when one doesn't exist.

Fine-Tuning White Balance.

Often the mood of the light that we want is close to what we already have. We're just not quite there yet. Your Nikon dSLR allows you to make fine incremental changes. How this is done from the menu varies in some cameras.

It's easy to do: just press the WB button and rotate the subcommand dial. On the rear control panel and in the viewfinder the changes vary from 0 to +1 to +2 to +3 in one direction, and from 0 to -1 to -2 to -3, in the other one. What's this doing?

For Direct Sunlight, the 0 point starts with the 5,200 K that Nikon has given you. It steps up to 5,300 K, 5,400 K, and 5,600 K. In the opposite direction, it steps down to 5,000 K, 4,900 K, and 4,800 K.

This works for any of the other predefined white balances that Nikon has provided, as listed on page 117. (It doesn't work with the Auto, K, or PRE options.) It provides an excellent

means of warming or cooling a setting in minor increments.

On most of the newer high-end Nikon dSLR cameras this fine tuning provides a range of temperatures from 2,700 K to 9,200 K.

In the large image to the right, Charlsey is in the 5,500 K of the Novatron flash units that we used. There is no special white balance adjustment. On this page, however, she's looking cold enough for a mug of coffee, in 4,500 K. To the immediate right, Charlsey appears toastier at 6,500 K.

Which one is the best?

Do you like your salsa mild, medium, or hot?

It's all a matter of personal taste. It has a great deal to do with the visual message you are trying to send. 🌸



Adjusted to 4,500 K



Adjusted to 6,500 K from 5,500 K, to the right.



Bracketing Color

Just as we discussed bracketing exposure (on page 89), here we are exploring how the same bracketing techniques can be used with white balancing. This provides fabulous opportunities to test and optimize before shooting.

On the Menu

If your Nikon is in exposure bracketing, switch to white balance bracketing by going to the Custom Settings menu (the pencil icon) and follow these steps with the Multi Selector's right arrow (the following menu numbers differ on some Nikon cameras):

- e Bracketing/flash
- e5 Auto BKT set
- WB..... WB bracketing (choose OK)

Until you change it, every time you use the

bracketing button, you'll be set for white balance bracketing. Return to the menu, to change to exposure, flash, or a combination.

The Bracket Button

Your bracketing button is marked with “BKT” and is above the “L” button, on the left with some cameras and on the back of other Nikon camera bodies, next to the trash can button.

Holding down the bracketing button allows you to operate the main command dial (the back one) to select between 2 or 3 to up to 9 shots that you'd like the bracketing sequence to include.

With the bracketing button still depressed, use the sub-command dial (in front) to choose the color increments you want. Each

change is roughly 10 mired (mired shifts are discussed on the opposite page). Choose from 24 different bracketing combinations.

Once you start shooting, each time you release the shutter, the white balancing increment will change. This allows you to make the decision as to when to take the picture, rather than it happening in an automatic burst.

To cancel bracketing, hold down the bracketing button again and rotate the main command dial until it shows no shots left in the sequence.

White balance bracketing will not work if you've chosen an image quality of NEF or NEF plus JPEG fine, normal, or basic.

Below, Matthew is tested in two white balance increments apart. The variations are small but significant. 🌸



5,000 K



5,600 K



6,300 K

Mired Shift

Common Mired Values

Light Source	Kelvin Temperature	Mired Value
Candlelight	1,930 K	518
Tungsten Flood Lamp.....	3,200 K	312
Tungsten Halogen Lamp	3,400 K	294
Slightly Cool Daylight	5,800 K	172

Rosco Cinegel Filters for Light Sources to Shift Color

Filter Number	Filter Name	Mired Shift
3420	Double CTO.....	+320
3407	Full CTO.....	+167
3411	3/4 CTO.....	+131
3202	3/4 Blue	+100
3401	1/2 CTO.....	+81
3204	1/4 CTO.....	+42
3410	1/8 CTO.....	+20
3114	UV Filter	+10
3208	1/8 Blue	-12
3208	1/4 Blue	-30
3206	1/3 Blue	-49
3204	1/2 Blue	-68
3220	Full Blue	-131
3220	Double Blue	-260

The term “mired” is a contraction of three words: micro, reciprocal, and degree.

Psychophysics identifies a “just-noticeable difference” as the smallest change of sensory input that humans can detect. So, a mired shift is the just-noticeable difference between two sources of light. More specifically, in the study of physical stimuli and mental phenomena, the mired is the shift in the color of light, on the Kelvin scale, to the point that we detect the difference. *(If you have not read about the temperature of light on pages 16 & 17, please do that now to understand Kelvin temperature.)*

In other words, it’s not just a number on the scale that makes no difference to our eyes. The separation is significant enough that one color is clearly different than the other.

How Much of a Shift?

A change of 100 K is more apparent in the lower reddish colors than it is in the upper bluish temperatures, where the temperature has to change to a far greater degree before we can tell the difference.

Between 3,000 K and 4,000 K there are eighty-three mired shifts, yet between 6,000 K and 7,000 K, there are only 24 mired.

As well as for white balancing, photographers must understand a mired shift for color meters and color compensation filters. 🌸

Visualize Angles of View

We've just explored lenses and light, so we understand how lenses produce optical angles of view, but how does light and camera placement call us to visualize the image?

The Glass's Angle of View

The fisheye lens provides a 180° look at the world. At 900mm, we go from that fisheye view of half of everything that surrounds us, and focus it way down to approximately 3°. All of our other interchangeable Nikkor glass falls somewhere in between.

Please ponder the possibilities of what the graphic on this page of all those lens angles is opening your creative mind to explore before reading further.

Taking It Lying Down

Sometimes we have to get up and off our behinds and other times we do our best work lying down.

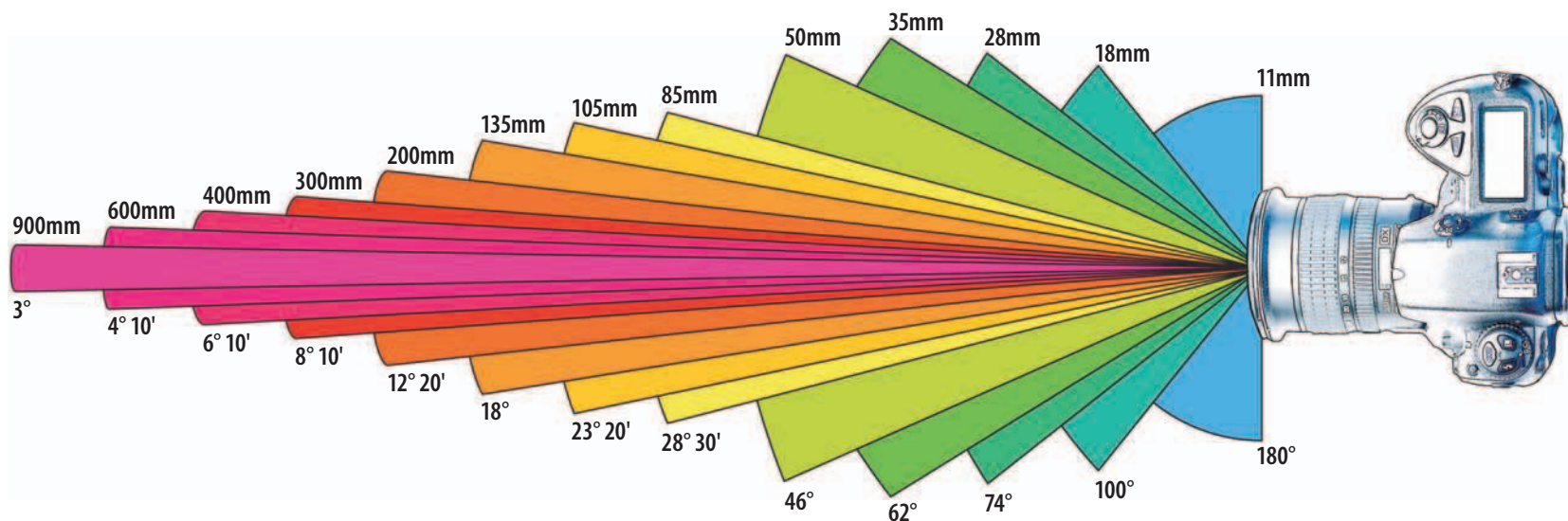
We photograph many scenes standing up. Depending on your physical height and shoe heels, we make many of our images from how

high our pupil is above the ground, maybe 55 to 70 inches up.

That's not a bad thing. We show the world images as the world normally sees things. Our audiences can relate to photos taken from a perspective of its usual vantage point: just under 5 feet to just over 6 feet. It doesn't shake up their normal mind-set.

Other times, it's our job to show the world something it usually misses.

Each one of these focal lengths not only shows us the perspective of life if we were no



taller than a puppy, but it also brings great drama to a visual. With a telephoto lens and a subject many feet away, there are untold elements in the foreground that are a total blur.

The same shot, with a wide-angle lens, makes our far away subject tiny and the expanse of land in front, huge. The wider the angle, the greater the role that the sky plays.

When you're shooting low, standing subjects take on a greater stature.

Light from Down Low

Here's where spot readings are valuable. When you shoot close to the ground, you get some great light readings of the sky.

If your goal is to photograph the sky, your images may be on-the-money when it comes to exposure. However, if you're photographing people and you need great flesh tone, either take a reading with a hand-held meter, as we discuss fully in the next chapter, or use your camera's spot metering options, as we explored on page 86.

Bird's-Eye View

Make a completely different visual statement. Shoot from above.

Shoot from a ladder or a balcony or a bridge. At a wide-angle, people are tiny players, not a force to be reckoned with. The scene in a large public space is a story of many little ants going about their tasks.

With a telephoto lens, you see things as if from an Omnipotent's perspective, who secretly and quietly is present but unseen. The viewer either sees the lives of others, yet goes unnoticed by them, or is easily recognized. Either way, the viewer has the power position and the subjects are cast with smaller roles. ☼



Light and Perspective

Perspective provides a two-dimensional image with a sense of having three dimensions.

Leonardo da Vinci wrote, “The object that is nearest to the eye seems larger than another of the same size at a greater distance.”

Zooming Isn’t Enough

Just because you can zoom in and out on a subject does not mean that you’ve added a greater sense of the image being any closer or having more dimension. The more you zoom in, the more you magnify. Zooming out to a wider position takes in more of the scene and the wider view can tend to distort perspective, but does it add a sense of distance?

Repositioning

To add that sense of perspective, try repositioning the camera. Keep your eyes open for the view that makes your foreground subject appear greater in size than what’s behind it.

Highlights and Shadows

How a subject is lit adds dimension. Two similarly lit objects, one behind the other, properly composed, instantly convey perspective. When the viewer feels that the objects, in your two-dimensional frame, are so 3D that they can reach into the picture and touch them, you’re there. 🌸



Wide and Narrow Luminance Ranges

Luminance refers to light that is emitted by an object. With the exception of the blackest black, all objects reflect light.

The Range of Luminance

Some scenes have a fairly narrow range of luminance. Without any light metering tools, we can look at these scenes and recognize them. They are characterized by fairly even tones. There's plenty of specular diffusion, but specular highlights are tough to find and any shadow details are clearly identified. Photographs with narrow luminance ranges are easy to reproduce in any medium.

A wide luminance range can pose challenges. As with any challenge, it's a matter of managing the situation and making it work to our advantage.

The wise photographer analyzes the scene and pinpoints the area of specular diffusion. Once identified, this area becomes the key to proper exposure.

From there, metering to understand the range of f-stops in either direction (shadows and highlights) is essential. In some media, highlights may wash out and shadow details can block up.

The image to right has a very wide range. It's highlighted with bright white, extensive shadow detail, and bold color. 🌸



Diffraction and Image Crispness

Light travels in a straight line. Light diffracts, to some degree, at any aperture.

Minimum Aperture Diffraction

A drop-off in a lens's sharpness can occur when it is

stopped down to its minimal aperture. When light is forced through a relatively small opening, the light rays tend to scatter, more than at mid-aperture.

Maximum Aperture Resolution

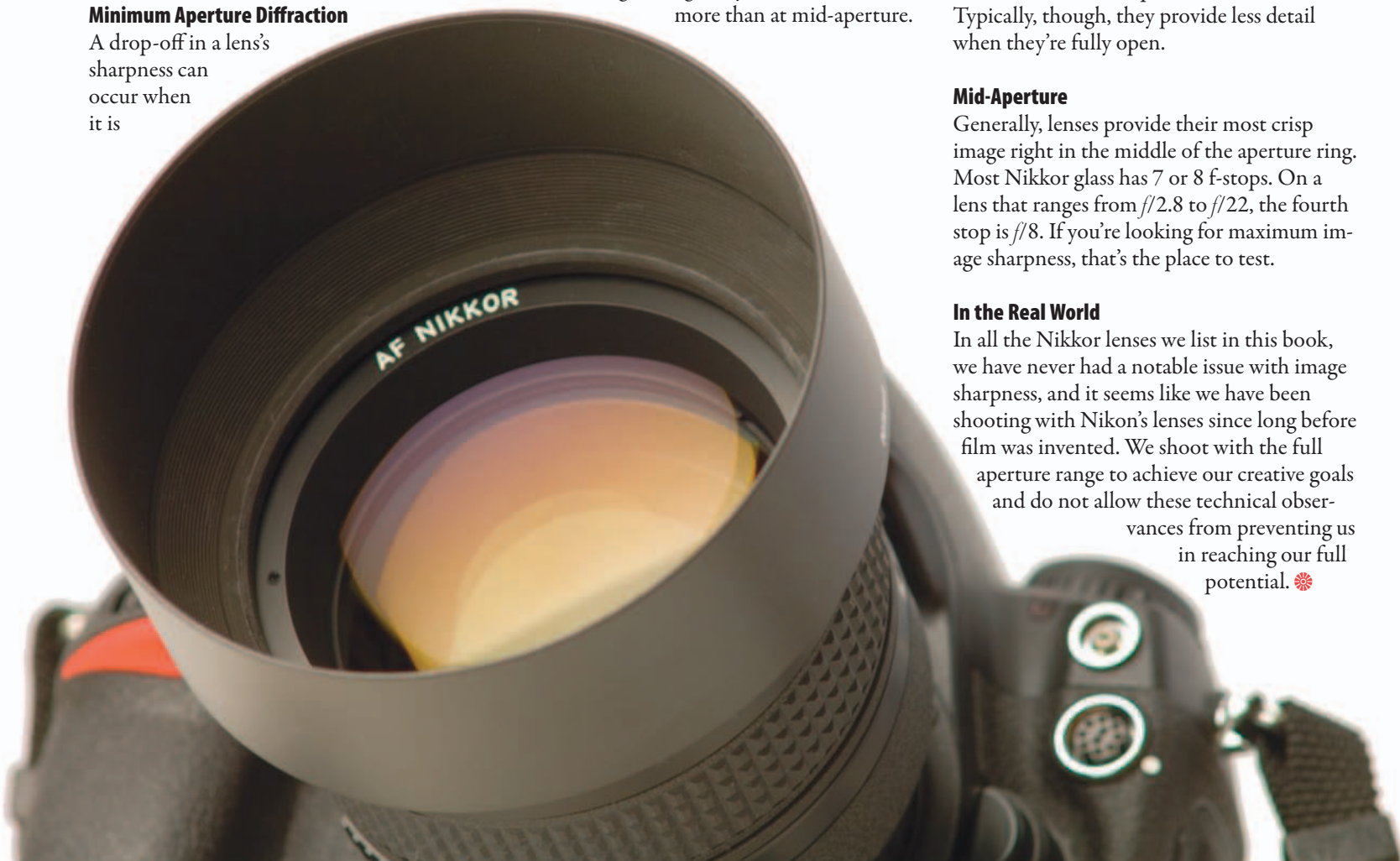
Some lenses do not have their best performance at maximum aperture in some cases. Typically, though, they provide less detail when they're fully open.

Mid-Aperture

Generally, lenses provide their most crisp image right in the middle of the aperture ring. Most Nikkor glass has 7 or 8 f-stops. On a lens that ranges from $f/2.8$ to $f/22$, the fourth stop is $f/8$. If you're looking for maximum image sharpness, that's the place to test.

In the Real World

In all the Nikkor lenses we list in this book, we have never had a notable issue with image sharpness, and it seems like we have been shooting with Nikon's lenses since long before film was invented. We shoot with the full aperture range to achieve our creative goals and do not allow these technical observations from preventing us in reaching our full potential. 🌸



Viewfinder Screens and Your Eye

Using a digital single lens reflex (dSLR) camera to determine exposure is highly dependent on the focusing capabilities of the camera.

Viewfinder Focus

You must adapt your camera to your eye. If you are nearsighted, you're in luck. Things that are very far away are just a few inches from your pupil in a dSLR's viewfinder.

Pull out the diopter adjustment knob and move it back and forth until the viewfinder's display and focusing brackets are as sharp as

you can get them. Doing this takes a little finesse. Keep playing with it. Many photographers can shoot without eyeglasses, once the diopter adjustment has been made.

If this is not enough for your vision's needs, you can get an accessory that's stronger.

Shoot sharp.

Focus Area

Nikon designs each of its dSLRs for a specific kind of user. To some degree, each camera is identical and, on other levels, each is unique.

All of them use focusing brackets. When you depress the shutter release halfway, the viewfinder's brackets illuminate in red.

The focusing and the metering are tied to the choices you make in the viewfinder.

The Multi Selector as Essential Cognitive Skill

The photographer who can master the use of the multi selector and the focusing brackets is on track for a successful career. If you find yourself fumbling your way through the use of the multi selector, you absolutely must practice over and over until it is second nature. For some, this rapid response eye-hand coordination does not come easy.

Make a promise to yourself that you'll master it. This is an essential cognitive skill for every photographer.



When you look through the viewfinder, your creative eye must see your key focal point; and you have to recompose the shot, for the moment. Your thumb has to dance around the multi selector and adjust those focusing points, just like it's your car's steering wheel, that you know so well.

Master the use of the multi selector until it's something you can do in your sleep. 🌀



Area Modes

Again, so much of what you do with metering is tied to focus. You cannot get away with creating fabulously lit images unless you master the mechanics of focusing.

Dynamic Area Autofocus



This is the focus mode to master.

Depending on which Nikon dSLR you're working with, you select one of nine, eleven, twenty, or fifty-one focus points. For the most part, nine or eleven is practical for fast moving action.

You are manually selecting which focal point is preferred. However, the camera's using information from multiple focal areas to make the final determination.

Auto and Dynamic Area Autofocus



On newer Nikon camera bodies, auto area focus allows the camera to detect the subject, giving priority to humans. With dynamic area focus some focusing decisions are based on your input to the focusing area.

Group Dynamic Autofocus



This mode gives priority to areas of the viewfinder: top, bottom, left, right, or center.

Single Area Autofocus



The most simple of auto focus options is intended for static subjects. ☼

Focus Modes and the Power of Manual

There are times when the awesome power of auto focus just is not the best option. We come across this with many extreme close-up subjects. There's a very specific point in the image that we have to have. The D3's fifty-one focus point system addresses some, but not all, of these autofocus needs.

Focus Mode Selector

Your Nikon camera's focus mode selector is on the front, just below the lens release button. Just like many of the later film cameras, your choices are single servo autofocus, continuous servo autofocus, or manual. With these highly subjective manual decisions, the third of these is quite powerful.

For those of us who have been in this for many years, when the subject is not on the move, and you have time to carefully examine the static setup, there is great pleasure in the power of manual. You can make those tiny incremental

changes and explore different options, as you go along. When we are all alone, photograph-

ing nature, it is something of a meditative experience, like no other. 🌻





Measuring Light and Color

As fabulous as the in-camera metering systems have become, until they can jump out of the camera, run up to the subject and take a reading of the light falling on the subject, rather than reading the light reflecting off of it, they won't put the light meter manufacturers out of business.

Our Gossen Starlite all-in-one light meter and Gossen Color-Pro 3F travel with us on even the most simple photographic adventures. The Starlite reads ambient light and flash illumination in either incident or reflected modes. It takes broad readings or spot readings to as tight as 1°. The Color-Pro reads both continuous light and flash illumination. Both meters can do some of our calculations for us.

It is impossible to successfully do digital studio flash photography without a flash meter.

We know what we want from the end results of our photo sessions. The meters are not intended to tell us exactly how to set our shutter speed, aperture, sensitivity, and white balance.

We use them to gather data so we can make informed decisions for ourselves.

Without light and color data, photographers cannot understand all available technical options to make their creative efforts their very own. ❁

Light Meter Skills

For shooting in complex lighting situations, a great flash meter is essential.

Many professional photographers own at least one hand-held meter. Even many who are in photography as a portion of their livelihoods find that they cannot get by without an off-camera meter.

There are some very inexpensive meters that get your readings into the ballpark. Many professional photographers depend on rugged, durable light meters that are accurate to a tenth of a stop.

Some light meters just read ambient illumination and others measure both ambient and flash.

Reflected Light

The meter in your camera measures reflected light with the light that strikes a subject, bounces off of it, and travels in your direction. The reflected readings take into account color, contrast, brightness, tonality, and the effect the texture of the surface has on the scattered light, as well as its shape.

Incident Light

In photography, incidence refers to a beam of light moving in a straight line.

All that the incident meter reads is light that falls upon its sensor. How much of the

light that the subject reflects or absorbs is neither here nor there to the incident meter. It doesn't take color or surface into consideration. All it can read is the incoming light.

The reading that it provides renders ivory as ivory and dark chocolate as dark chocolate.

The Anatomy of a Multipurpose Flash Meter

Our Gossen Starlite all-in-one flash meter is completely self-contained. There are no interchangeable disks or tiny accessories to drop or lose. It's extremely powerful, yet very simple to use.

The Measuring Head

The eyes of the meter are in the (where else?) head. It rotates 270° so the dome can face away from you while you are looking at the display, when you're taking readings.

When not in use, the dome retracts into the position used for flat diffuser incident

light measuring. To use it as a spherical diffuser, rotate the diffuser ring downward.

The side of the Starlite's measuring head has an optical viewfinder. You look through the right side and point it toward a subject. There's a 12° viewing field, so you can easily find your subject. It takes a spot, reflected reading of 5° or 1°. You activate those modes with the rotating diffuser ring in one of the top two positions.

Function Keys and Display

The two big function keys on the front of the meter allow you to choose ambient light (the sunshine icon on the display) or flash (the lightning bolt).

Dual ISO and Setting Wheel

There are two ISO buttons. You can take a reading and then select either one and it converts the reading back and forth between the two sensitivity presets.

You set the sensitivity by holding down one of the ISO buttons while rotating the setting wheel on the right side.

Measuring Buttons

There are two buttons for measuring light. They're on the top and bottom of the setting wheel. The one on top takes a new measure-



ment and deletes the previous one. The bottom button allows you to collect up to eight readings and it calculates an average. 🌀



We could not function, on many shoots, without an excellent multipurpose meter.

Next to our cameras, it's one of our most essential photographic tools.

Incident Readings

Using the Gossen Starlite meter to take incident readings couldn't be easier.

When to Use the Flat Diffuser?

Lower the dome to the flat diffuser position when shooting flat art, such as copy jobs.

The beauty of the dome in the retracted position is that it is shaded for dealing with multiple light sources. One light source does not spill as much into the other.

Spherical Diffuser

Raise the spherical diffuser by using the diffuser ring. Dial it all the way down to the bottom position. This setting insures that light falls on the three-dimensional dome just as it falls on a three-dimensional subject, such as a human head.

Practice with the meter in ambient light mode, as discussed in the previous two pages, "Light Meter Skills." For a general reading, hold the meter in front of the subject and point the dome toward the camera.

Collecting Data

One reading isn't going to do it all. Your subject is three-dimensional. Delve into what

is happening with light all around the subject. Before taking readings, observe what is happening with the light. Where are the shadows? Where are the highlights?

- Locate the ever-important area of diffused highlight. It's your point of measurement departure. Meter it.

- Find the specular highlight. Meter it.

- Locate the subject's deepest shadow areas. There may be more than one. Meter for the shadows.

(Are these terms for textures, highlights, and shadows foreign to you? That's okay. Please go back to pages 32-37. It's all in there.)

Now, note all the data that you have collected and consider the spread. Is it a three-stop range? Five stops? Seven? Nine?

Carefully examine the metering samples to the right. Use them as a starting point. Some refer to these as lighting ratios. We get deeper into that when we explore measuring multiple light sources on pages 144 & 145.

To the right, Michelle is purposefully lit with multiple light sources. These add some nice visual drama.

We have provided a few theoretical examples of how things would work if the incident

light were able to focus in on just the diffused specular on her cheek, the specular highlight in her hair, and the shadow area near her ear.

Because the lighting has some dimension to it, the diffused specular to the specular highlight is going to have a two-stop spread. The same is true of the identical diffused specular to the shadow area.

There isn't a known target range for a ratio. You have to figure it out based on what you are trying to say photographically.

This example has a relatively narrow range to it. The specular isn't significantly blown out and there are plenty of details in all the shadows. The light has drama, while maintaining an evenness. 🌸

In our theoretical example, the measurement of the diffused specular is f/8.0 at 1/60 of second for a sensitivity of 100. This is what we set for our exposure.

From there, we are trying to learn whether we are going to be able to hold the details in the shadow areas and whether the specular highlight will completely blow out Michelle's hair.

With a range of f/16 for the specular highlight to f/4 as our shadow area, we have a reasonable set of ratios for just about all uses.



Light Source Size and Distance

When it comes to reading light, it's best to understand the cause-and-effect relationship between the technical difference that you are measuring and how it affects the creative application of your image-making.

Three-Dimensional Contrast

Most photographers work with three-dimensional subjects. How light interacts with contoured subjects is far more complex than flat ones.

The tools and principles for shooting flat and contoured surfaces remain the same.

The human face has many planes and surfaces. Consider just the nose. Light wraps its way around this facial extremity finding highlights on the skin that cover the nose's bone tissue, creating shadows in the nostrils.

Slowly moving a single light source, in front of the face reveals many lighting variations on the nose. Raising the light up and down does the same.

Rolling a large light bank up to a face until the talent feels that it's uncomfortably close evenly floods light all over the face. The contrast is remarkably minimal. The effect can be quite flattering as imperfections diminish.

The further that same bank is rolled back, the more shadows develop. From a great distance, the contrast seems extreme.

If we light a flat card with two equidistant, identical light sources, we have even illumination across the card.

Replacing the card with an off-center cube, we may see three variations of how the visible planes of the cube are lit.

The same would be true for how a ball picks up shadows and highlights.

If we replace those objects with a face, we would still have an evenly lit photograph, but the face and all its surfaces and textures have a fascinating catalog of highlights and shadows.

Quality of Light and Size

We select light source sizes based on the lighting effect that we wish to exert on our subject.

The smaller the light source, the more contrast the subject exhibits. The larger the light source, the more the light hugs the subject.

"Which is best?" can be answered only by the photographer and client. Light source size makes a visual statement.

Quality of Light and Distance

Again, we make the same point as in our discussion of three-dimensional contrast: the closer the light source is to the subject, the softer the light's quality becomes. The further the light source is moved from the subject, the more contrast is displayed.

Size and Distance versus Intensity

On page 138, we explore the inverse square law. Before looking at the science, let's visit the effects, in simple terms.

Small light sources are efficient users of light. Put a Novatron Bare Tube Head in a Chimera 24" x 32" Shallow Plus Bank and it will allow you a smaller aperture than if the front panel of a Chimera 54" x 72" Super Pro Plus is in the exact same place with the exact same flash head.

The big guy has more space for the light to rattle around in and floods more light all over the place than the little guy.

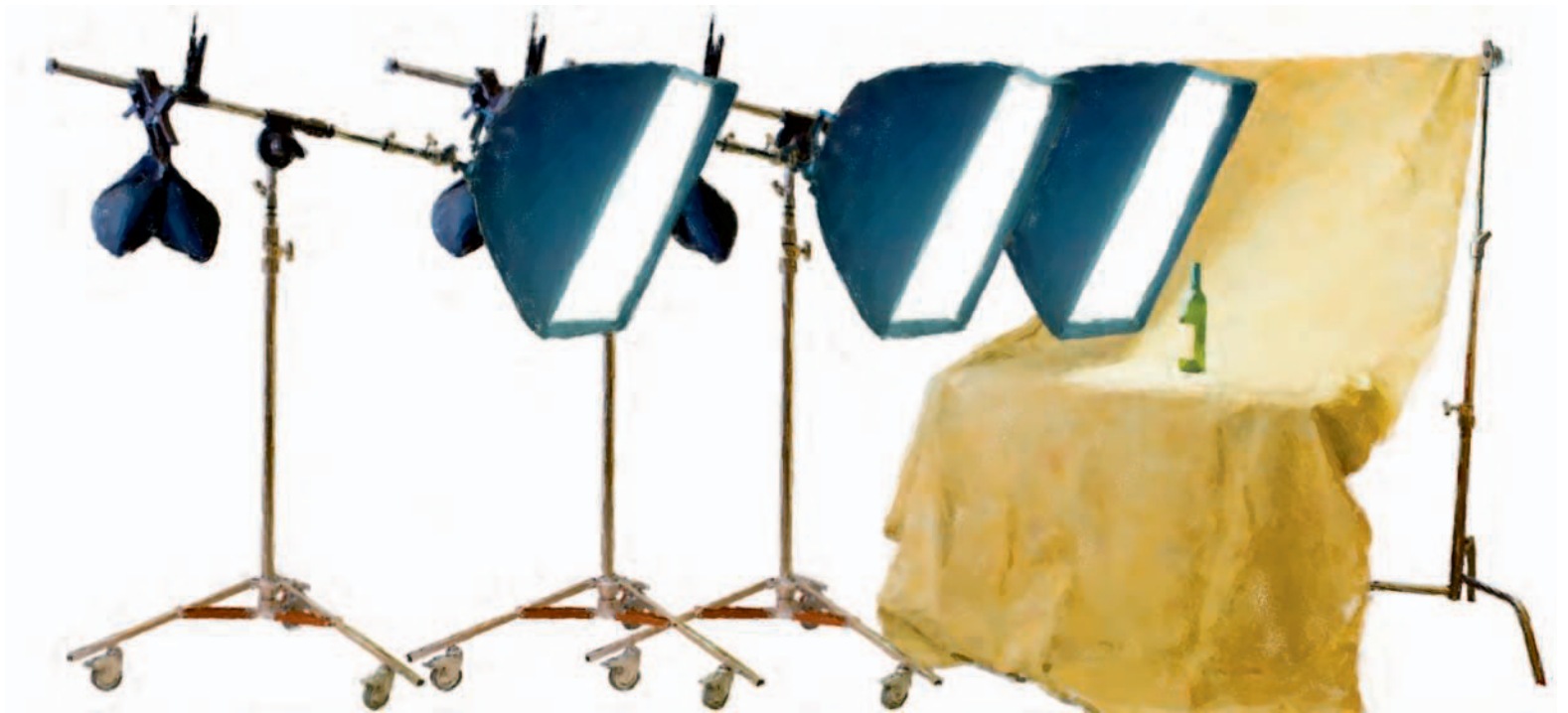
With either bank, the further you move it from the subject, the more the efficiency of the light falls off. Every time the light-source-to-subject distance increases, the aperture needs to be opened further. 🌞

In the example to the right, the light source moves to three positions. At first, it is close to the wine bottle. Then it doubles the distance. Finally, it doubles the distance, again.

This illustrates the point made previously.

As the light source moves, the quality of the illumination changes, as well as the intensity of the light and its effect on the exposure.

A photographer must weigh all of these cause-and-effect relationships when lighting an image in order to obtain the desired results.



The Inverse Square Law

You cannot fully understand what to expect from a lighting instrument until you comprehend the inverse square law.

Light Diminishes as It Travels

The theory behind the inverse square law is that light diminishes at the square of the distance from the light source to the subject. The light starting at the source becomes less bright as it gets farther away from that source. As it travels, it has a greater and greater area to cover. The more light spreads out, the more it thins out.

If we measure light, one foot from the light source and it provides a reading of $f/22$, we will get a lesser reading at two feet than we do at one foot. This is because the light needs to cover twice the area at two feet as it does at one foot. The light not only travels twice the distance, but it also spreads over an even greater area.

Because the distance from the light source to the subject has doubled, the proper exposure is halved. Our meter reading would be around $f/11$, instead of $f/22$.

Applying The Law: #1

We can apply the inverse square law by doubling our light-source-to-subject distance and opening up two stops. If we move the

light source closer to the subject by half the distance, we'll close down two stops.

Applying The Law: #2

When we move the light source closer, the light wraps around the subject and it becomes softer. When we pull the light source back, the image quality hardens.

If you like what the light is doing for the subject at $f/11$, but you need the depth of field of $f/16$, take the law into your hands and double the intensity of the light, leaving the light source and subject right where they are positioned.

The further the light source moves from the card to the right, the harder the shadow that it casts.

Theory and Application

The inverse square law works in theory. In practical application, all sorts of ambient conditions come into play. Use the theory to understand the rela-

tionship of light source to subject distance and light source intensity. 🌞

Either half the exposure, if the light source to subject distance has doubled, or maintain the exposure and double the intensity of the light.



The Gray Card

Sometimes conditions simply do not work for taking an incident reading. Maybe you're too far away from the subject while the lighting conditions are quickly changing. However, an assistant or stylist is close to the subject. This is a great opportunity to raise a gray card and take a light reading.

Maybe this can be done with your camera, or maybe this is a great time for using the spot meter's 1° mode.

A Gray Card?

If most of what we see were to be tossed into a blender, the resulting tone would be a value of 18% gray. We call this “neutral density.”

When you take an incident reading, your meter suspects that the universal neutral tone is what you're looking for.

If you can't be right there with the subject to take an incident reading, put a gray card in place of your subject and take a reading off of it.

A gray card can be something as simple as cardboard that reflects 18% of the light that strikes it. However, if the card is in the range

of two or three feet, it's easy to fill a camera's frame from a reasonable distance or be perfectly positioned for getting a spot reading from quite a span from the photographer.

Keep in mind that light is directional. If

you're using the card outdoors, try angling it in the direction of the sun. Take a measurement off of it and compare the two readings.

We use a Lastolite 30" Ezybalance Grey/White Card. It collapses down to a small circle and tucks into a small pouch. Its surface is

designed to retain the 18% tone. Flipping it over reveals a white surface, so it works for white balancing and as a reflector. 🌻



We quickly pop open a Lastolite 30" Ezybalance Grey/White Card and take a reading off of it, when needed

The Flash Meter

To fully appreciate the value of the flash meter you need to visit Chapter 13, “Digital Studio Flash.” Without a flash meter the photographer is clueless about exposure. In the studio flash environment, the flash meter is an indispensable tool.

The ever-vital flash meter must do more than measure flash illumination for many users of these AC-based flash units. Studio flash is used more and more outside of the studio. Therefore, a great flash meter must also read ambient light.

That’s why we depend on the Gossen Starlite as an all-in-one meter.

Studio Flash Primer

Studio flash comes in two flavors. One variety is the power pack that plugs into the wall outlet and has the control panel, which runs the show. The lighting instruments, known as flash heads, are plugged into the power pack.

The other type of flash is a self-contained lighting instrument, sometimes known as a monolight. It’s something like a power pack and flash head that are fused together.

In either case, when you release the shutter on your camera, the lighting needs to know that it’s time to flash. The most basic way

of doing this is to run a PC cable from the control panel to the camera.

The control panel of a power pack or MonoLight has a test button. Pressing it fires the flash.

Sync Speed and Manual Mode

Your camera has an upward limit as to how fast the shutter speed can operate in synchronization with the flash. For years the standard has been 1/250 of a second. Nikon DSLRs are capable of synchronizing at speeds faster than 1/250 of a second, but that’s only when used with Nikon Speedlights.

It’s possible to select a slower shutter speed. We get into more about that in Chapter 13.

Your camera is set to manual mode. You choose a shutter speed of 1/250 of a second, or slower, and the flash meter provides the missing ingredient of the aperture.

Flash Readings

It’s possible to place your flash meter precisely where your subject will be located, walk over to the flash unit’s control panel, press the test button, and most flash meters will have a reading waiting for you when you get back to the meter.

This is easily accomplished with a Gossen Starlite. With the incident dome raised,



change the function keys to highlight the lightning bolt in the display. Use the setting wheel to give the meter the same shutter speed as the camera’s.



Now, press the top measuring button and the meter will wait for that test flash to be fired. Have the flash meter facing the light source for that one overall measurement of the aperture.

Trigger Flash

Running back and forth between the flash unit's control panel and the meter may be great exercise, but it quickly becomes annoying. Matters are made worse if your light source is a MonoLight that's on a light stand where the test button is so high that it's a few inches out of reach.



Fortunately, our Gossen has a socket for the flash sync cord. While we're taking flash readings, instead of plugging the sync cord into the camera, we can attach it to the meter. Every time we press the measure button, the flash fires. This not only gives us an instant response but it allows us to be sure that we have the meter pointed exactly where we want it.

Flash + Ambient

The aperture that the meter suggests is a combination of the illumination that the flash provided, along with the ambient light. The sum of those two types of light sources appears on the display, digitally, to one-tenth of an f-stop.

The analog portion of the display offers an added treat. One indicator on the analog scale is flashing. That's the flash measurement. Another indicator that's not flashing is the ambient light reading.

If you want the flash to completely blow out the ambient light, the two should be far apart. If you're trying to balance the two readings be sure they are closer. The meter is an exceptional tool for determining the ambient light's role in the photograph.

Making Choices

If something about the measurement was not what you had hoped for, see what other options are available. Without taking another measurement, rotate the selection wheel. It recalculates for you.

Multiple Flashes?

If you're looking for an amazing depth of field for a still life, one pop of the flash might not do it. You may need to be working in a darkened space and to leave the shutter open while the flash is fired from the flash unit's test button a few times. Photographers do this after they have expended all available flash power.

Our Gossen can figure out how many flashes we need from the reading we just took.

With the right function button depressed, rotate the settings wheel until the display shows an "f" with a box around it. Release the function button and dial in your desired f-stop. The display now shows an "F" with a number next to it. This is the number of flashes that it will take to achieve the aperture that you chose. ☼

Spot/Reflective Readings

When you use a spot meter, it is not dramatically different than what happens when you use your camera's meter. The measurements that you take are of reflected light, which is light that strikes a surface and bounces your way. Most Nikon DSLRs are excellently equipped to base an exposure on a 2° spot measurement. *(Please see pages 90 & 91 for more on this.)*

What you do with a spot meter is different. You use the meter to collect information and decide what are your best options.

The 1° Spot

On the Gossen Starlite, we flip the setting ring at the base of the diffuser's dome all the way up to the top position. The dome retracts and we're ready to use our all-in-one meter's viewfinder.

When you look through the Starlite's viewfinder, there's a 12° field of view. This assists you in orienting yourself to what you're looking for. There are two circles inside the viewing field. The larger one is for taking 5° measurements and the smaller one targets your 1° readings.

Because this is reflected light, you'll get high readings from bright spots and lower measurements from shadows. This is exactly what you are trying to learn with this exposure tool. Direct your attention to the area of specular diffusion, those neutral territories that match

what a gray card would report.

Averaging

While you are taking various readings, it's helpful to have someone assist you in doing the math. Let the meter do it for you.

Take your reading, as usual, with the Starlite's top measuring button. Take up to eight more readings using the lower measuring button. Each one appears as a bar in the display's analog scale. The display is showing both the average of all the readings you have taken and a reminder of how many measurements you've done. 🌸



Volume/Time Priority Metering and EV

Just as you're able to set your camera to aperture or shutter priority, you can do the same with your meter. This is as easy to setup as it is to use.

Aperture Priority

On the Gossen Starlite, hold down the left function button and rotate the settings wheel until the “f” has a frame around it. Take your readings with the top measuring button. Because you have given priority to the volume of light that the aperture is letting into the camera, the meter is giving you the shutter speed to match that.

Move the settings wheel to change the aperture. There's no need to take any additional readings to do that. Just dialing a different aperture changes the shutter speed.

Time Priority

Just as you did for aperture priority, hold down the left function button to highlight the sun graphic on the display. Keep holding down the function button and spin the setting wheel until the frame appears around the “t” on the display.

Take your readings with the top measurement button. This time, you have given priority to the amount of time the shutter remains open, so the meter is having you measure

aperture. Again, watch your options change as you browse through them with the settings wheel.

Exposure Value

In Chapter 2, “Digital Exposure and Optics,” we discuss exposure value, also known as EV, in a variety of places. You might want to review it (*see page 84*) to fully appreciate how the meter makes that a useful communications tool.

It's easy to convert the measurement that you took to an exposure value. Hold down the function button again while turning the settings wheel. After a few turns, your aperture reading will change and an “EV” will appear over the new number. That's your exposure value.

Hold down the left function button and make one click backwards to return to the aperture measurement. ☀

It's convenient to tripod-mount a meter when you cannot be exactly where a reading must be taken.

To the right, the meter is displaying the exposure value.



Light Ratios for Multiple Light Sources

When you take multiple light measurements on a subject, you are in essence determining your light ratios. You're taking readings on the difference of light in one section of the image compared to another. If you have not read pages 32-37, where we get into terms on highlights and shadows, please do that now.

Key, Fill, Hair, and Background

A time-honored portrait setup uses four lighting instruments:

- The main light source is also called the “key light.”
- Additional illumination comes from a “fill light.”
- To provide a feeling of dimension, a “hair light” comes from behind.
- If the subject is seated on a background, a “background light” illuminates it.

Metering a Single Light Source

Your key light might be a flash head in a large umbrella, maybe a couple feet above the subject. You might want this to the right of the camera. Let's say that you have determined that your key has an aperture of $f/11$. It is your diffused highlight; it's the norm.

For our discussion of light ratios, we'll give this a value of 1.

In a one light portrait, a shadow would appear to the left, because the key is to the right.

As the umbrella isn't all that far to the right of the photographer, the shadow detail is very good. When we take another reading in the shadow detail, we get a measurement of $f/8$.

There's a one-stop difference between the key and the shadow. Because our key is a 1, the one-stop departure is a 2, which gives us a ratio of 1:2.

If our spot meter were to read $f/11$ off the diffused specular, when it read the specular highlight, the hot spot on the face that provides a mirror image of the light source, we might have $f/16$. (Generally you don't want to be dependent on reflective readings for something like this.) The specular highlight is one stop more than the diffused highlight, so now we have a ratio of 4:1:2.

Metering Multiple Light Sources

Taking measurements for multiple light sources is similar. We retract the dome of our Gossen Starlite for this, which allows us to read each light individually. Some photog-

raphers like to use their hand to shield the dome of their meter from the other light sources. If they are able to switch lights on and off without affecting the light output of the other instruments, they take measurements, one light at a time.

In the image to the right, we used three light sources, all Novatron flash heads in Westcott umbrellas. There's a key and fill. The third is the hair light, for dimension.

Often location backgrounds can be cluttered and distract the viewer's attention. Allowing it to go a couple stops darker, and the use of the large hair light pops out the subjects with a dramatic flare that's better known to commercial photography than it is personal portraiture.

The key light's specular appears in the reflection on Sara's lipstick that stylist Tracey Lee enhanced. It balances the +2 stops of hairlight on her, whereas Pipe takes the preferred upstage lighting of the fill.

In Chapter 13, “Digital Studio Flash,” we go deeper into how to control the studio flash environment to your advantage. 🌸



Color Metering

Until you have a color meter, you have no idea what an indispensable tool it is.

There are two misrepresentations by some, about color and the digital work environment. One says whatever mistake you make, you can fix it in Adobe Photoshop and the other says that you can correct it with your camera. Both are misleading statements.

If the color of one light source is off and all of others are on the mark, as awesome as the digital resources may be, you're in trouble.

How It Works

Knowing what you want a color meter to do is almost as important as how you do it.

Our Gossen Color-Pro 3F works with both ambient light and flash. For all it can do, it's far more simple to use than our Gossen Starlite light meter.

Like the light meter, there are two function buttons on the front and a measuring button on the side. The side of the meter also features up and down value switches. That's about it.

All agree it is important to properly set the white balancing of your camera. To do that you need to know the color temperature of your light sources. They can be a mixed bag.

Color meters were once a resource for choosing filters to place over the camera's lens. Today, the camera's white balancing feature is

something of a digital filter set. We do all of that in camera.

Getting Started

Adjust the meter's film type to 5,500 K. *(If you have not read pages 16 & 17, "The Temperature of Light," please do that, now.)* On the display, the function button gets you to the first item on the left, "FILM." Match this in your camera. *(We discuss that on pages 116 & 117, "Balancing Light to White.")*

If your camera is set to something other than 5,500 K, adjust the meter. One move to the right, with the function key is "VARI." The values buttons on the side allow you to reset this to your needs. It gives you a range of 2,000-9,900 K, in mired increments. *(To understand mired shift, please see page 121.)* These variations are stored in the meter. If you're just getting started, you might not want to adjust this just yet.

Continuous Light

As with the light meter, use the color meter to measure the light falling on the subject. To do this, move the function button to the third position that is a graphic of the sun. Point the diffuser surface toward the light source and press the measure button. The color temperature of the light appears to the right of the "film" temperature.

After the meter offers this comparison of the color temperature that it measured against the camera's white balance, it calculates the filter values for adjustment. The values in mired are the ones that can be applied to the camera's white balancing.

Flash and Mixed Light

This is where it gets fun.

Use the function button to move one more mode to the right: the lightning bolt graphic.

Just like with the light meter, a sync cord can be plugged into the color meter so that the flash can be fired whenever the measuring button is pressed. As with the color of the ambient light, this can be applied to the camera's white balancing.

With mixed light, you cannot make the corrections on the camera. You correct the light source.

Please see page 296, "Color Correctors." It discusses how we apply sheets of Rosco filtration media to vary the color quality of the light that these instruments create. 🌈

The color meter appears to be a complex instrument. It's not. Functionally, it is extremely simple to use and provides a wealth of information to improve the color outcome of your photographic efforts.





Light, Color, and Use

Before you shoot, you must understand the end use. If you don't, you may create some fabulous images, but how they are going to be used is far from what you envisioned. Let's say your photos make quite a stir on the internet, bringing millions of page views for a web site and your the photographic fame spreads far and wide for those 1530 x 1024 pixel per image JPEG files. When someone offers you a substantial sum of money for 2' x 3' prints of those images and you shot them as 1.6 megapixels jpegs, you're not only out of luck, you're out of income.

Equally, if you shoot for print publishing and process all of your photos as CMYK, so that you can see exactly how they are going to print, when the client tells you that they accept only RGB, you need to rework the whole job.

You can have complete flexibility in the creation of the raw file, but knowing end use determines how the image is lit and how the color is interpreted.

Newspaper publications and ink jet printers both use cyan, magenta, yellow, and black inks for their color images, but the range of light for the two are completely different. If newspaper is the primary use, you need to calculate for that.

Images that run on high-definition plasma screens have a very different viewing audience than images on the web. However, what prolific television news organization does not run their best content on web pages, too?

Build your imagery house on a firm foundation. 🌸

The End Use Determines Everything

Consider a fraction of the end uses that just one of your photographs could have over the vast available media spectrum:

- Small ink jet prints
- Internet
- Books/fine magazines
- Newspaper
- Big screen TV
- Canvas/fine art paper exhibit prints
- Jumbo point of purchase

The only thing that the items on this short list of media have in common is that your work can be the content.

At times the needs are quite specific and at other times they are as vague as they can get.

There are color models and gamuts and resolutions and image sizes and ranges of light and file sizes to consider, before you even begin to plan the shoot.

Tone Compression

There's a ratio of about 1,000:1 of the tones we see in the sky, on a sunny day. Consider the brightest spot on the top of a bright, glistening fluffy cloud, on one end of the ratio, and the near impossible to see details of under the darkened stairs, at the end of a blind alley on the other.

We reduce that 1,000:1 ratio photographically to less than 100:1.

Once we put that image up on a fine-quality sheet-fed printing press running a high-opacity paper with a bright gloss surface, our ratio gets down to around 20:1, at best.

This ratio reduction is known as “tone compression.” It's a common problem.

Dynamic Range and the Printing Process

A great photo session can delight the photographer, the client, and everyone involved. Viewing the images at 100% on a large, crisp, bright, calibrated display can bring “Ooo!” and “Ahhh!” responses from all at the brilliant highlights and fabulous shadow details and eye-popping color.

However, once it's proofed, on press, everyone is disappointed.

What happened?

Using the metering techniques that we discussed in the last chapter, you should be able to hold the details in the highlights and shadows over a range of at least six f-stops, maybe even more.

The printing process converts those continuous RGB tones on your monitor to tiny halftone dots on a CMYK press.

The color model is different. The means of reproducing the photo is different, too. These differences mean that the sheet-fed press has the ability to reproduce only a four

f-stop range. To a pressman, this is known as a density range of around 1.9.

On the Web

Have you ever done an absolutely gorgeous web site for a client that people send you much kudos over, only to hear that it looks dark or the color is off?

You may have calibrated LCD displays but others can be judging your work from five- or ten-year old CRT monitors that know no means of correction for color, brightness, or contrast.

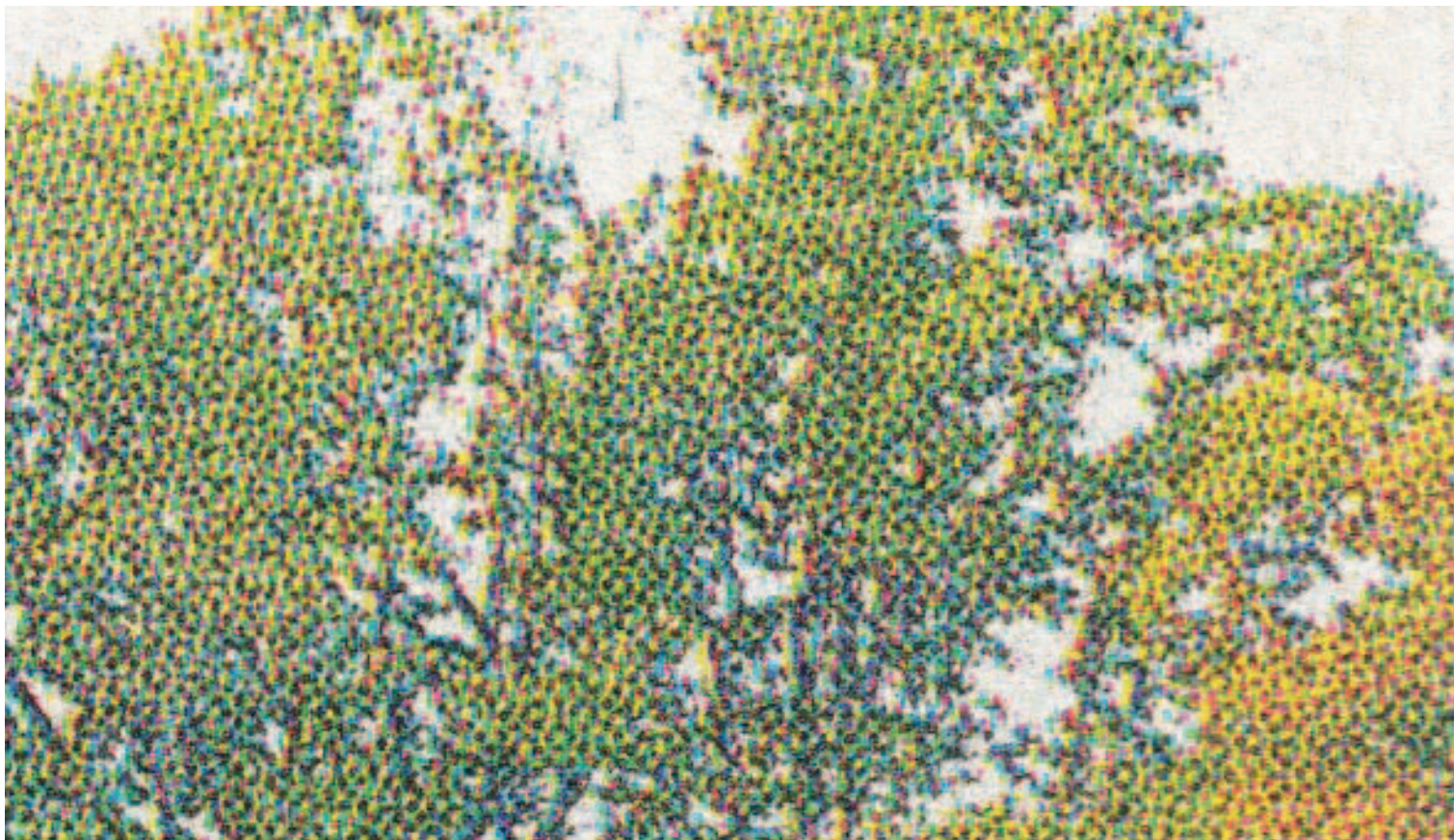
Broadcast Digital Television versus Internet

Broadcasters are in a media-rich environment. It's not just the six o'clock news. The public's appetite for information is 24/7/365, and it must be fed constantly.

News is delivered in DV, on the web, in QuickTime, as Flash, in PDF, on iPods. It's everywhere, in every form. One size does not fit all.

To satisfy these needs, you need an managed workflow. One image must be reprocessed for multiple uses, in multiple sizes, in multiple formats, all in next to no time.

These are exciting times for the image-maker. Embrace the technology. Unleash the creative synergy. Learn how to balance the light and color to its best. 🌟



This dramatically enlarged newspaper photo provides a clear view of why the offset printing process has a limited dynamic range of color and light.

Color Models

Color is communicated with an alphabet soup of initials.

Each model has its own qualities and limitations. These models dictate the final appearance of your photographic efforts.

A color model is actually an abstract mathematical model. Each one has three or four component colors. Each component is numbered. When the numeric value of each is adjusted, a separate color is created.

Color models are many. We're focusing on the ones that you encounter in most photographic work environments.

RGB

This model of red, green, and blue is well known to monitors, cameras, scanners, and televisions. Notice how each of these sources of color information deal with light. RGB is an additive color model. Light is the foundation of additive color. Add red light to green and you get yellow. Switch the light's green filter to blue and the mix will be magenta. Now mix blue and green and you'll get cyan. When all three are at full intensity, the result is white. Shut off all three and we get black.

These additive colors are the same as those that stimulate the receptors of our eyes. They are the closest to the human visual experience.

When all three are at full intensity, the result is white. With nothing added and all three shut off, we get black.

RGB has a broad gamut. It's a larger range of color than the second most popular color model, CMYK. That's why RGB is an excellent model for your raw images.

Additionally, we have the RGB web colors that are an indexed set of 256 or fewer, specifically for use in web graphics, primarily in the GIF format. These were once critical due to limitations with internet bandwidth and the capabilities of early color monitors.

CMYK

The process colors of the printing press are cyan, magenta, yellow, and black. They are the basis of your ink jet printer, as well.

CMYK is a subtractive color model. It is known as such because it starts with a surface, such as paper, and adds ink or dye over it so that less of the surface is visible.

Cyan light is an equal mixture of green and blue, so cyan ink reflects all but red light.

Yellow is an equal mixture of red and green, so yellow ink reflects all except blue light.

Green light is the only one not reflected by magenta ink. As you may have guessed, it's an equal mixture of red and blue.

The darkening agent is the black, which also adds an appearance of a more crisp image.

HSB

Hue, saturation, and brightness is also known as HSV and HSL. Those designations call brightness "value" or "lightness." It's also known as LCH for lightness, chroma, and hue. It's all the same thing but with different names, to keep us on our toes.

The HSB model is found in software applications like Adobe Photoshop and is a different representation of RGB. It's also in some color choosers.

Lab Color

In the Lab color model, the "L" represents lightness and is intended to match how human vision deals with the lightness. The "a" and "b" are two channels of hue and saturation components. It's intended to have a perceptual uniformity and can be used to make accurate color balance corrections. This is unlike RGB or CMYK, in the sense that they are designed for output devices like cameras and printers, rather than human visual perception.

Lab is also found in Photoshop, so we included it here, but for the most part, it doesn't fit into color models that you'll encounter in your day-to-day photographic workflow. 🌸

Green

Red Green & Blue (RGB) Seen in Human Vision

SMPTE-240M

Wide Gamut RGB

sRGB

ColorMatch RGB

SWOP CMYK

BruceRGB

Red

Blue

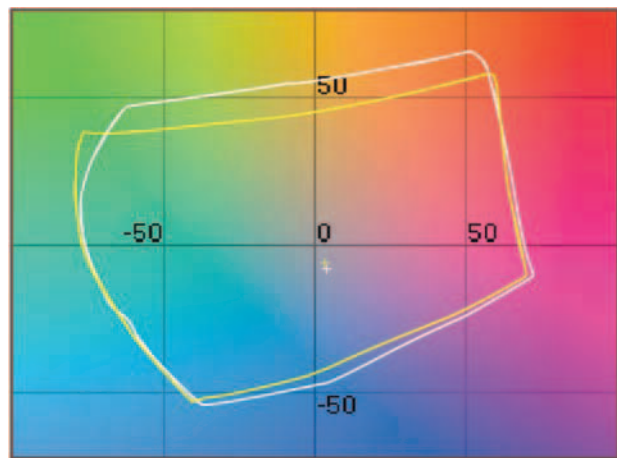
One of the most important things we learn from the full gamut of color models is that there's a dramatic difference between what the human eye sees and how much of that is reproduced on the offset press's SWOP CMYK. In between is what our cameras and computer displays show us. As photographers, we need to have an awareness of this in delivering the image for the end use.

Color Gamuts and Working Spaces

Whenver most Photoshop professionals hear the word “gamut,” they think of what is not possible rather than what can be done. Photoshop can show you what colors are out of gamut.

Gamut?

Think of gamut as a range of colors within a color model. The gamut represents what can be successfully displayed or printed. The RGB color model, being larger than CMYK, can display colors on your computer’s monitor that are out of gamut on your CMYK printer. It’s a color alarm that warns, “This won’t work.”



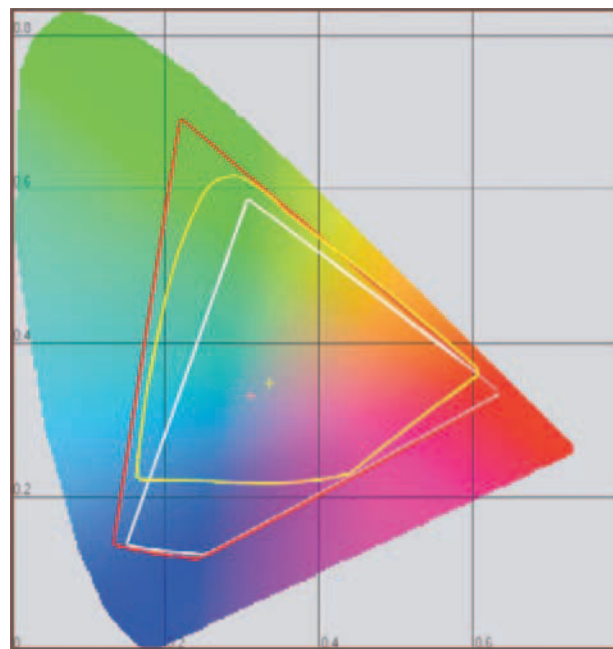
Adobe RGB Workspace

A choice of color workspaces pops up everywhere these days. It’s something you need to be aware of on monitors, cameras, when saving files, doing calibrations, and making choices about printing, to name a few.

Basically, a workspace is a portion of a color model. It’s set aside to assist the user with certain working limitations.

Within the RGB possibilities is Adobe RGB (1998). It’s recommended for projects that go to print. Adobe RGB includes cyans and blues that are not available in the popular workspace sRGB. With some exception, it’s the choice of many professional photographers and commercial clients.

To the left is a typical gamut with Lyson inks, and ink2image paper. The wider white line is an Epson printer, the yellow another brand. Above is a work space with red being Adobe RGB, white, sRGB, and yellow the Epson print space.



sRGB

This more limited workspace is preferred for images that end up in web usage. It’s geared toward standard monitors. sRGB is also popular with entry-level digital cameras.

Some photo labs that service the needs of wedding and portrait photography studios prefer sRGB. 🌸

Color Depth

Is bigger always better? That's a very valid question when it comes to color depth (also known as "bit-depth").

This term describes the number of bits that are used to represent the colors in a single pixel. This is also known as bits per pixel (bpp).

The larger the color depth number, the more distinct the colors should be.

A good way to simplify bit-depth is to think of a one bit pixel. It can be either black or it can be white.

16 Bits per Channel

Those who are hungry for more embrace sixteen bits per channel (bpc). For each primary color this provides a range of 65,000 variations, compared to the 256 per channel with eight bpc. This means that you have 256 tonal steps, in sixteen bpc, for every one tonal step in eight bpc. This makes a great deal of difference when it comes to correcting problem areas on an image.

So with sixteen bpc having so much to offer, why do so many work in eight bpc? File size is a factor. A sixteen bpc image is twice as fat as an eight bpc. For some, that's a storage problem. For others, it slows down their workflow: their computers take longer to process these bigger images. The biggest argument in favor of eight bpc is that in

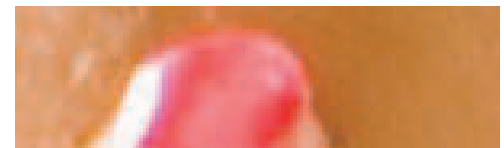
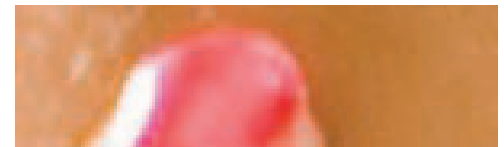
actual use the difference may not be seen on the screens and prints that the viewing audience has available to them.

32 Bits per Channel - High Dynamic Range

High dynamic range (HDR) images are the source of much discussion among the most diligent photographers. This is something that most cameras cannot capture, printers print, or monitors display.

To make a very fast summary of HDR's benefits: it allows luminance levels that far exceed that of eight or sixteen bpc. Photoshop professionals make corrections in HDR and then convert down to the tonal range that they want. 🌸

In the 500% enlargements (right), the sixteen bit image is on top with the eight bit, below it. Do you see the difference between the two, in print? We don't. That's why eight bit is still an industry standard.



File Format and the End Result

There are many file formats out there. New ones pop up from time to time, and old ones get better. For this discussion, we're going to just visit what your digital single lens reflex (dSLR) camera can record as well as manipulate in postproduction.

Raw

We have devoted the majority of Chapter 6, "Raw Files and Scanned Films," to this topic. "Camera raw" is a general term. It isn't a specific file format. Each camera manufacturer manages their own raw format, so the filename extensions vary. You may hear people refer to their raw file format by the extension name. By way of example, the extension name for a Nikon camera raw is "NEF." For another camera brand, it will be something else.

As the term "camera raw" implies, it's an image file in its purest form. Just like cutting and polishing a raw gemstone after it has been mined, some of the fine-tuning of the image takes place in postproduction. As we stress elsewhere in the book, this doesn't mean that you can make a careless photographic mess when you're shooting, and expect to have a sparkling diamond later.

Chapter 6 takes you deep into what Adobe Camera Raw permits you to do with the image in post. Adobe regularly updates this plug-in.

JPEG

The Joint Photographic Experts Group developed this format in 1990. It's pronounced "jap-eg." It's become the most common means of compressing an image.

"Compressing" is the operative word to the wise. A JPEG is a "lossy" format. One of its original intents was to get images out on the World Wide Web in a manner that would allow them to appear as fast as possible for folks who had Internet access via primitive telephone dial-up connections. A JPEG (often seen as "jpg") does retain the RGB color information, but compresses the file size by selectively throwing away some of the data.

The creator of a JPEG photo can choose what level of compression that they want. The more they compress, the lower the image quality becomes. When the maximum quality option is chosen, it results in a photo that closely resembles the original.

Most cameras allow you to save as a JPEG. Some permit you to save both a JPEG and a raw file. This allows you to have one great image to manipulate later, and something that you can send to someone right away.

Some photo labs that specialize in wedding and portrait packages encourage photographers to send them maximum-quality JPEGs, right out of the camera, just like they had been shooting film. The photographers report pleasing results and happy customers. It cuts the need for postproduction. Other photographers are in total disagreement.

TIFF

The Tagged Image File Format (TIFF) was developed by Aldus, a company that Adobe acquired. It's pronounced just like the word that means "to quarrel," but few take exception to this standard of the publishing industry. The TIFF (also used as just "tif") goes back to 1992.

When you need to shoot a high-quality, ready-to-use image, this is the way to go. As with a JPEG, a TIFF can be compressed, but that's not a common practice.

The only downside of a TIFF is that its files are larger than those of the other two popular options. TIFFs consume more space on your camera's memory card, recording fewer images per card, and taking more time to record from the camera's buffer to the card.

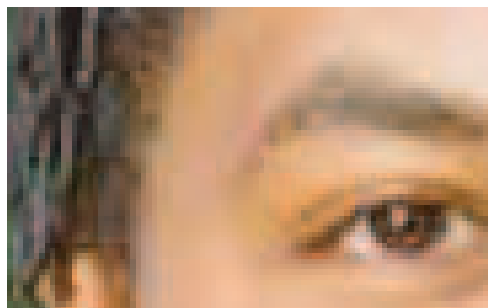
Size Matters

If a camera raw image equals 16.3 MB, a TIFF will weigh in at 35.9 MB, while a fine-quality JPEG comes in at only 5.7 MB.

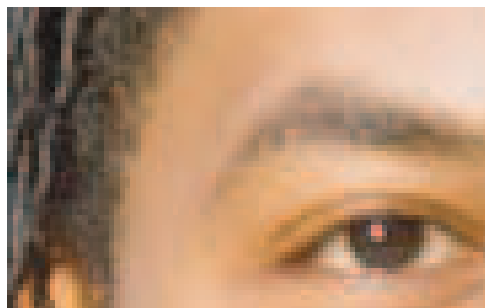
A 4 GB memory card will only hold around 106 TIFFs, but 154 NEFs, and a whopping 558 JPEGs. 🌸



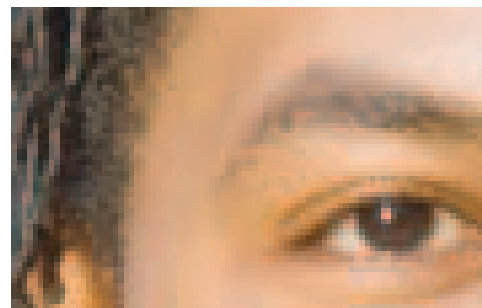
The above tif is reproduced, below, at low, medium, and maximum jpg levels, skipping medium and very high. They're enlarged to 200%.



jpg low.



jpg high.



jpg maximum.

Understand Image Size

Some refer to those of us who make their living in Adobe Photoshop, Corel Painter, and the like as “pixel pushers” because we manipulate these big files of pixels.

When it comes right down to the heart of digital photography, it’s all about the pixel.

Real-World Megapixels

No matter how computer-savvy we may be, the math behind megapixel can escape us. The term pixel is derived from the words “picture” and “element.” Obviously, megapixel translates into a million pixels, but how is that relative to making photographs?

In commercial application, an image needs to be at least 10 megapixels (MP). Any worthwhile professional or “prosumer” dSLR can do that.

A 10 MP image is 3,872 x 2,592 pixels, which, sure enough, works out to a total of 10,036,224 pixels.

In English, Please

What’s that in inches?

When you open the image in Adobe Camera Raw, it’s just that: a raw image. You can have Camera Raw process it to a variety of sizes, but if all you want Camera Raw to do is open the file unprocessed in Photoshop, you might still have some size decisions to

make, even if you don’t want to resample the image size but you do want to keep it as pure as possible.

Megapixels to Megabytes

These slightly over 10 million pixels vary in file size, based on what’s on the photo. Some images produce bigger files than others, but it weights in at somewhere around 15.2 megabytes, in file size.

Pixel per Inch Usage

There are some industry standards for how many pixels per inch (ppi) are used for different purposes. Some fluctuate based on the end-user and others cannot be changed.

High-quality publishing.....	300 ppi
Ink jet printer	150 ppi
Internet	72 ppi

Publishing

In the printing industry, images are converted to halftone screens. All those little dots are measured as lines per inch (lpi). The closer together those lines are, the greater the detail they hold and the sharper the images appear. A high-quality book or fine magazine prints halftones at 150 lpi, on a good-quality paper. Typically, the prepress folks want images that

are twice the pixels per inch as the lines per inch. So, if a project runs at 150 lpi, the image needs to be 300 ppi.

Therefore, our 10 MP image, without any resampling, can be as large as:

12.907" x 8.64" @ 300 ppi

Ink Jet Printers

Opinions vary on what sort of resolution is best for ink jet printing. Some feel that it needs to be 200 ppi, others think 150 ppi is just fine. Without getting into that discussion, let’s just give the image the benefit of the doubt and go with 150. This conveniently needs to scale down a little to fit through the popular 17" throat size of high quality printers.

25.813" x 17.28" @ 150 ppi

Internet

There’s no room for negotiation when it comes to the needed resolution for the web. It’s 72 ppi.

53.778" x 36" @ 72 ppi

Obviously our 10 MP camera is more than qualified for any web images. (That would be one very big monitor!) ☼



The top image is from a 12.4 MP file, as captured, with no upsampling, and the lower one is at 1.6 MP. The enlargement, on top, is at 300%. Whereas, the lower photo is at 832.5 %. Obviously, the smaller file does not hold up.



Upsampling and Downsampling

Before Adobe Camera Raw takes all the postproduction work that has gone into your raw file and processes it to a dng (digital negative), jpg, psd (Photoshop), or tif file, you need to choose a resolution.

Upsampling: How Big?

Here's where you get to watch your 10 MP image grow. This is called "upsampling."

If you're starting with a 10 MP image of 4,096 x 2,742 pixels per inch (ppi), this process can grow it to a 25.3 MP image of 6,144 x 4,113 ppi.

In the real world, some would run that image through an ink jet printer as an impressive 40.96" x 27.42" photo.

Does it work?

Some are purists about a thing like this. They feel that you should never upsample. Their thinking is that this 72+ MB image loses some of its image quality as it is having its pixels increased.

In commercial application, there isn't much room for discussion. Something in the vicinity of a 50 MB file is what's expected.

Please examine the samples to the right. We have enlarged them considerably so that little of what we're trying to show would be lost in the halftones.

Downsampling

Creating an image at a smaller file size than captured ("downsampling") is an excellent way to take a bunch of your fully processed and retouched images and turn them into some quick-view JPEGs. Adobe Camera Raw does more than open camera raw files. For example, you can use Camera Raw to open other file formats and create JPEGs from your TIFFs.

For these quick-view images, we choose the smallest resolution, 1,530 x 1,024 ppi, which is the same as an image from a little 1.6 MP camera. This is what downsampling is all about.

The Possibilities and Advice

Our suggestion is to always shoot to the largest size possible and always retouch at the full 25.1 MP size. You can downsample at another time, but the results may be less than satisfactory if you have to upsample, later. An upward interpolation can look a little too rough for many. 🌸



The top image was upsampled in Adobe Camera Raw to 25.1 MegaPixels. The lower photo is as shot at 12.2 MP. It takes a 350% enlargement, of the latter to comparatively examine the two. The top image is enlarged to 246%.

Though we see a warm color shift in the upsampled image, the image sharpness looks quite similar.



This image of Leah is neither upsampled or downsampled. It's at 100% of the 12.2 MP file.



Preproduction Smarts

If you want to have a fabulously organized shoot, learn how to do it by visiting a kindergarten classroom.

There's a place for everything and everything is in its place. Everything is scheduled.

That's the only way you can safely and securely deal with a room full of four- and five-year-old precious assets. No matter how careful and planned the kindergarten day may be, over time just about everything can and will go wrong. The only way you can have control is to have a plan in place for everything.

Anything else is irresponsible.

Just like a bunch of youngsters having fun, we want our shoots to be a great time for everyone. We strive to make them uplifting events where everyone feels good about the results, good about themselves, and good about their careers. At the end of the shoots, we get lots of hugs.

In actuality, it's well-managed chaos.

From a professional perspective, these photo sessions must turn a high yield. So much must happen in preproduction and postproduction that the actual photo session is a small slice of the time pie. Without great preproduction, not enough happens during the shoot and there's not enough that's worth processing in post.

During a full day's shoot, we knock out thousands of images. These things are not cheap to stage. Anything else than a high yield is a financial loss that we don't care to weather and a let down to everyone involved, as well.

We approach this with responsibility. 🌻

Paper Planning and Tear Sheets

Our shoots start with planning sessions many days, sometimes months before we pack the car for the location.

For some background, we're primarily in the business of shooting images that appear in books, seminars, and other educational materials that are repurposed as stock imagery.

Stock photography is vibrantly alive. It's an instant response to the imagery needs of many worldwide. Though many photographers financially and creatively thrive on assignment photography where the client has a strong involvement in the visual direction, we enjoy charting our own course. Stock imagery is highly rewarding.

We had been in the assignment photography business for many years, and thoroughly enjoyed it. It's a collaborative relationship.

Tear Sheets

It's important for image-makers to have their fingers on the pulse of visual directions. You need to feel where graphic trends are moving, and how the creative community is currently expressing itself.

This does not mean that you should copy the directions you are seeing today. You must find your own style.

Some of what we see in magazines today may have started in production six months or a year ago. So, by the time you see it in print, it's hardly a new trend that's moving through the underground of the world's creative capital cities.

We use tear sheets for inspiration. A "tear" is a page pulled out of a magazine or some other print piece. Sometimes these are from mainstream periodicals. Other times, the sources are more remote. Often, we see inspiring visuals on the screen of our television or via a web page or in a retail display.

Wherever it comes from, we save it and set it aside to assist us in planning a shoot.

This is where we look at color, light, and composition. We train ourselves to be able to look at images and have a good sense as to how the shot was lit, or how we'd go about lighting it.

On Paper

Some think that it all happens electronically these days.

We disagree with the "all" in that remark.

We do thumbnails and preliminary comps (short for "composite") on paper, at first. It's how we quickly express ideas during planning sessions. That's how we get ideas percolating.

We bring our comps and tears together, as ideas begin to gel.

If you work alone, get together with other creative people and share ideas.

Talent Cards

The next step is to plug the talent into the picture (literally).

We have a great deal of fun on a shoot. Some talent we love to work with again and again. These models bring something special to the table. They become part of the team.

Many of them act as well as do still imagery. They have printed cards with a "head shot" and images from other shoots that they've done. We like to mix in fresh faces, too. Sometimes these are people that we meet somewhere, out-of-the-blue. It always brightens someone's day to hear, "You could be one of our models."

Our style is to shoot with "real people" talent. They're faces that people can relate to. It's not that we oppose fashion models; that's just not our direction.

Primarily, we work with talent agencies. Most of the models who appear in this book are listed with the Hutson Talent Agency in Portsmouth, Virginia. 🌸

图 1 展示了在 1990 年 1 月 1 日至 1990 年 12 月 31 日期间，中国各省份的 GDP 增长率。图中显示了各省的 GDP 增长率，其中广东省的 GDP 增长率最高，达到了 15.5%。其他省份的 GDP 增长率分别为：浙江省 14.5%、江苏省 14.0%、山东省 13.5%、河南省 13.0%、湖北省 12.5%、湖南省 12.0%、四川省 11.5%、安徽省 11.0%、福建省 10.5%、江西省 10.0%、河北省 9.5%、辽宁省 9.0%、吉林省 8.5%、黑龙江省 8.0%、陕西省 7.5%、甘肃省 7.0%、青海省 6.5%、宁夏回族自治区 6.0%、内蒙古自治区 5.5%、新疆维吾尔自治区 5.0%、西藏自治区 4.5%、云南省 4.0%、贵州省 3.5%、广西壮族自治区 3.0%、海南省 2.5%、澳门特别行政区 2.0%、香港特别行政区 1.5%。



Deciding what goes
on top is easy.

A woman with curly brown hair, wearing a blue denim shirt, is smiling and holding a margarita glass filled with a drink and a lime wedge. The background is a blurred indoor setting.

You choose the brand for
the irreplaceable cinnamon scents.
Deciding what goes
on top is easy.
Margarites, spreads,
and all things artificial
need not apply.

THE LAST-THING-THING: The bar DREA's at the Catherine Hotel is for sports enthusiasts—just what if you like the first-rate New Zealand cooking of chef Christian Kauri and the atmosphere. At the 50 Oregon Ave. eatery, the chef's breakfast restaurant, we serve up a local influence: Australian native Frank B.

...the Book of
... West 28, back
... James Carville
... dishes out
... American late
... from
... a streak
... Nick & Steve
... in Jan. An
... him Spri
... per ex
... mode
... hug

100%

Circuit
tower

L O R

It's knowing that nothing is
Then I choose wh

Sk
Ca
re-

"Sure, calcium is great for my bones.
But who knew it was so good for my skin."

Diane Keato

It all starts w

Scouting and Electronic Planning

The next step is finding the location. Just as we have some favorite talent, we have some places that we like to revisit throughout the seasons of the year. The trick is to never let it look like somewhere from another shoot.

Scouting Locations

If the location is a fair distance away and our schedule is tight, we send an assistant producer. This is a leap of faith. The assistant needs to know our eye, our shooting style, the way we compose and shoot, and how we light.

Scouting a new location is where the creative juices should begin to flow. In your mind, the possibilities need to come flooding forward. The ideas from the tears and comps need to look like realities in the making.

At that point, it's crucial to envision not only how the setups will be lit, but all the technical and logistical considerations as well. Is there sufficient electrical power? Where will the models change? How far are the setups from the cars?

For outdoor shoots, the obvious consideration is natural illumination. This may require more than one visit, to plan light at various times of day.

You need to have a sense of what's going to happen where and at what time. Before you leave the location, you need to have the

schedule coming together on your clipboard. What's the light like at this spot in the morning and how does the shoot progress around the property by the afternoon? This is true not only for exteriors but in the role the light and its color play with window light.

Scouting Shots

When we scout, we bring the actual lenses that we'll use on the shoot. We try to set up our angles and our optics and sometimes place ourselves in the shots to get a sense of how we'll place talent. That way, on the day of the shoot everything has a better chance of falling right into place with as few surprises as possible.

Editing and Renaming in Bridge

Back at the studio, we download our scouting shots, using Adobe Bridge and its Photo Downloader application. Downloader lets us do a real rough edit before bothering to dump the remaining images onto one of our servers.

We do the serious editing in Bridge. That's where we batch rename the chosen images.

From there, we open the camera raw format photos, do some quick corrections, and generate tifs. These become the basis for the tighter comps that we do in Corel Painter.

Comping in Corel Painter

Corel Painter has excellent capabilities for doing some quick pencil sketches over the photos from the scouting session.

Once the tif is opened in Painter you can turn on "Tracing Paper" and draw over the top of the photo, which you can see on a layer below the paper. We do this with our Wacom tablets. (For more on these amazing digital input devices, please see our entire chapter on them, Chapter 14, "Essential Tablet Tools.")

Though Painter is geared toward the digital artist, this function is usable by anyone with even the most modest drawing skill set.

The result is a solid shooting plan that is more than obvious from the comps. Print them out and/or e-mail them to other members on your team. Keeping everyone on the same page opens the door to a successful photographic session. 🌸



From our location scouting snapshots, we use Painter to develop comps of our shooting goals.

Manage Memory on Location

In the days of film, that little 35mm canister was heavily guarded, in great reverence, from the time it left the camera store until it was carefully delivered to the photo lab.

The memory card should be held in even greater esteem, even though it is far more rugged than the very temperature-sensitive emulsion-coated substrates that we once used.

Unlike the 36 film frames of photographs that we used to need to load and unload every time we blinked, a 16 GB memory card can hold around 960 camera raw images from a 10 megapixel camera. That's more than 26 rolls of film.

Memory Cards are Not Created Equal

These CompactFlash (CF) memory cards come in all sorts of capacities and price points with features important to professional photographers, but not instantly noticeable.

Flash memory is nothing new. It goes back to the 1980s. The CF format has been around since 1994.

CF cards operate in temperatures of 32°F to 140°F, a big change from the professional film that we used to keep in the refrigerator.

Transfer speed is a big issue with CF cards. Some are faster than others. CF card speed

is rated in multiples of X. One X equals a 1.5KB per second transfer. Higher numbers are faster. A CompactFlash card that's rated at 266X is transferring around 40 MB of images per second. From a 12.4 megapixel camera, that's around two images per second. A 133X card writes one image per second from the same camera.

Some CF cards do not have that X factor noted on them. These bargain cards are no bargain on a shoot. Transferring one image from the camera's buffer to the card can take a few seconds. When shooting action and fast-moving people, that's nowhere close to acceptable.

Managing Flash Media Wallets

These CF card storage pouches are appropriately named "wallets," because they contain valuable assets.

You must have a system in place for every shoot. Use the same one every time, so that it's second nature. Each photographer's initials should be on their cards, so there's no mix-up.

We program the cameras to put the photographer's initials in the filename.

When we shoot, each photographer has two flash media wallets. One is for freshly for-

matted blank cards and the other is for those with images on them. We wear the wallets on our belts.

There are only three places a flash card can be: in the flash wallet, in the camera, or in the reader. Flash cards are never left sitting around. We don't let them out of those three places for more than a few seconds.

We once had a huge shoot with plenty of talent and assistants, without this system in place. One card was reformatted before it was downloaded. We lost 400 images.

Examining Images

You must test and examine your image results before moving forward. As the shoot progresses, someone needs to be reviewing the photographs to be sure all is going well. That means regular downloading must take place. While the talent is changing, we shoot test images. Once the talent is in place, we hand off a card with the first few images on it for someone to check.

Please see pages 184-187, "On Location with Computers," for more on this. 🌻

The CF card wallets (right) are essential in managing image assets at a shoot.



Data Storage and Backups

Now that you've captured these precious photographic assets, what are you planning to do with them? Finding an answer is not as easy as it seems. The obvious response is to burn a couple copies of DVDs, then store one onsite and the other offsite. In case of an accident, the offsite set is your lifesaver.

The DVD method works, if you are not planning to utilize your images on a regular basis. However, we use Adobe Bridge, all day long. We're constantly in search of images. Some of the photos in our library become the basis of illustrations, with Corel Painter, or graphics, using Adobe Illustrator.

Publishing links are needed for Adobe's InDesign, on the print side, and Adobe's Dreamweaver and Flash for the Internet and presentation environments.

Our reliance on numerous software applications may be more intense than many photographers, but it's pretty much the norm for a multimedia studio.

Servers

Our Mac network leaves us dependent on servers. We use them on location and are tethered to them in the studio.

In 2007, Apple introduced Time Machine to their operating system, this provides an excellent means of backing things up auto-

matically. All you need is the external storage space to move everything on a Mac to another hard drive. This works for many, and the price for a FireWire external hard drive is so inexpensive that it's well worth the investment.

However, our needs, and those of other studios our size, are a little more involved. We have so many images that it takes a few terabytes to store them. This is similar to having many pages filled with 2" x 2" slides, twenty slides to a page. The more rolls of film you shoot the more filing cabinets are necessary.

Storage Math

Figure the cost of storage into what's involved in a shoot. Every time we shoot one usable image we create four to five files, minimally.

We start with a 12.4 megapixel (MP) camera raw file (NEF, in our case). From that, we open it in Adobe Camera Raw, with the intent of making a 25.1 MP tif. Because we have saved our settings in Camera Raw, an xmp file is generated. When we're done retouching the tif, we create a 1.6 MP jpg. That gives us four files. They're all in RGB.

If we are going to use the image in print, we need to open it in Photoshop and create a separate CMYK file. We tack that extra "f" on the filename extension for four-color images, calling it a tiff and helping us to

immediately recognize which files are RGB and which are CMYK. Adding an extra color makes a CMYK file chubbier than a RGB.

Now, one photograph consumes about this much space (rounded off):

nef.....	19.200 MB
xmp.....	0.008 MB
tif.....	71.800 MB
jpg.....	0.250 MB
tiff.....	<u>96.300 MB</u>
Total	187.558 MB

It's not unusual for two of us to shoot a total of 1,250 usable photos in a four-hour session, after we have edited them down to the best.

Kilo, Mega, Giga, Tera, Peta, Exa, Zetta, Yotta?

Each half-day shoot consumes around 234,447.5 megabytes (MB) of storage. In other techno terms, that's 234.4 gigabytes (GB), or 0.234 terabytes (TB).

If you're not completely up to speed on your "units of information," as they are known, it goes like this:

Kilobyte	1,000
Megabyte	1,000,000
Gigabyte.....	1,000,000,000
Terabyte	1,000,000,000,000

If that's not enough, it goes on successively to petabytes, exabytes, zettabytes, and yottabytes.

We, however, have no immediate plans of purchasing a petabyte server any time soon.

Terabyte Servers

A server acts like a computer. It appears on your network just like a storage device that you've plugged into your computer's FireWire or USB port. The beauty of it is that all computers on the network can not only access the server but can also share the files.

In the studio, we use a 2 TB server (below) that has 3 USB expansion ports. This allows us to plug more drives into it to grow its capacity.

On location, we take along a 1 TB FireWire drive that has Ethernet capabilities. 🌐



Synchronize Color

Judging light and color is crucial with photography. On the next two-page section, we get deeper into that.

ColorSync

One of the most simple ways of managing color on a Mac is with ColorSync. This program integrates all imaging devices (display screens, printers, scanners, and digital cameras) so that the color you see on your screen is the same as the color printed. This system provides fast, consistent color calibration on a Mac and has been included in the operating system since 1993.

That same year, Apple co-founded the International Color Consortium to develop a cross-platform profile format known as a Color Management Module (CMM). The CMM goes back to Microsoft Windows 2000. In Windows it's called Image Color Management (ICM).

Usually, with the Mac's ColorSync, color matching occurs behind the scenes. ColorSync uses the registered profiles from the manufacturers of printers and other devices to ensure that color matching happens throughout the digital workflow.

These profiles load into your computer from the software that came with it. Check the manufacturers' web sites for updates.

Display Calibration

A calibrated display is essential.

The Apple Display Calibrator relies on judgment calls made by each user for themselves. This reliance has its pros and cons.

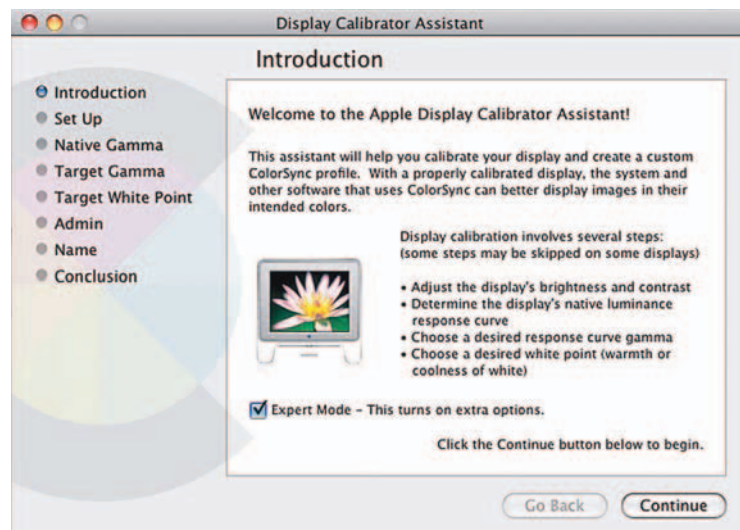
All eyes come with their own visual limitations. How you see color and luminance differs from how the next person sees it.

The results of this kind of calibrator is extremely personalized. It allows for screen adjustments that suit how you see things.

With the Apple Display Calibrator, choose the Expert Mode as you determine your display's native luminance response curves. It allows you to refine the target gamma setting and white point, too. On concluding the setup, it produces a display profile ICC.

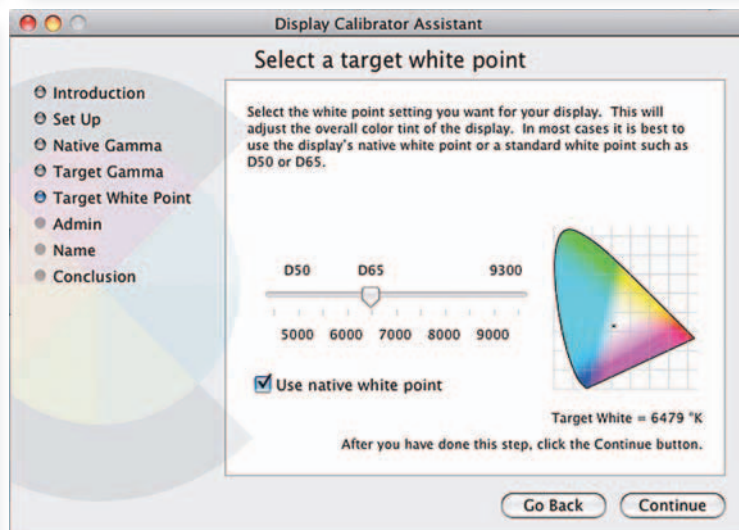
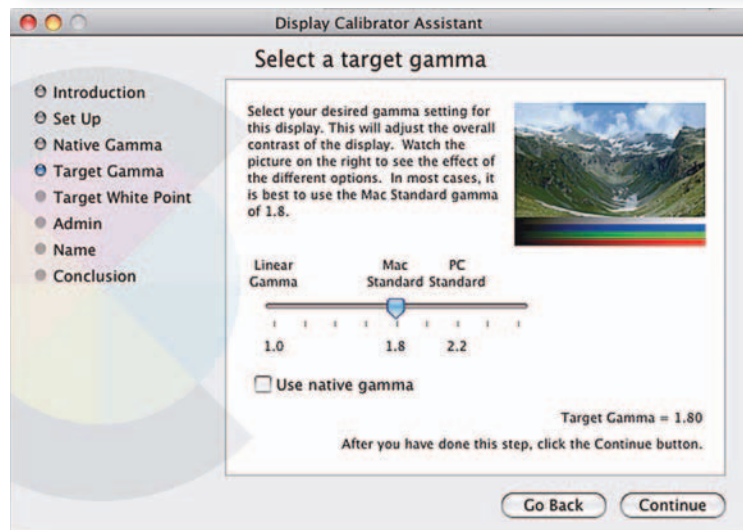
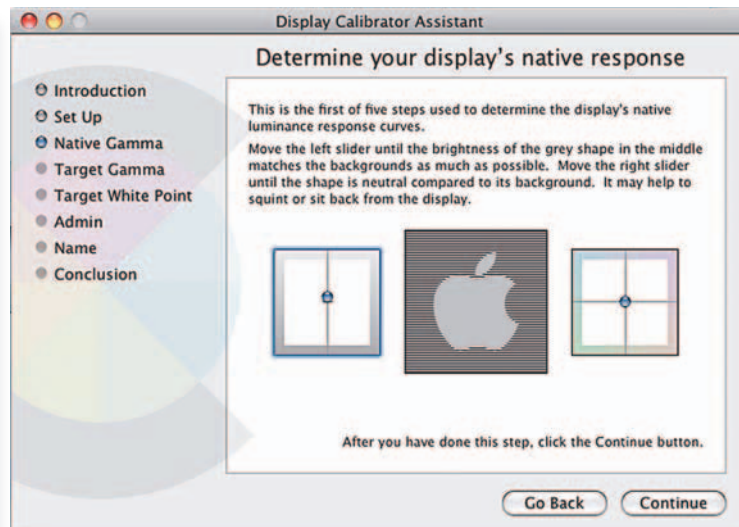
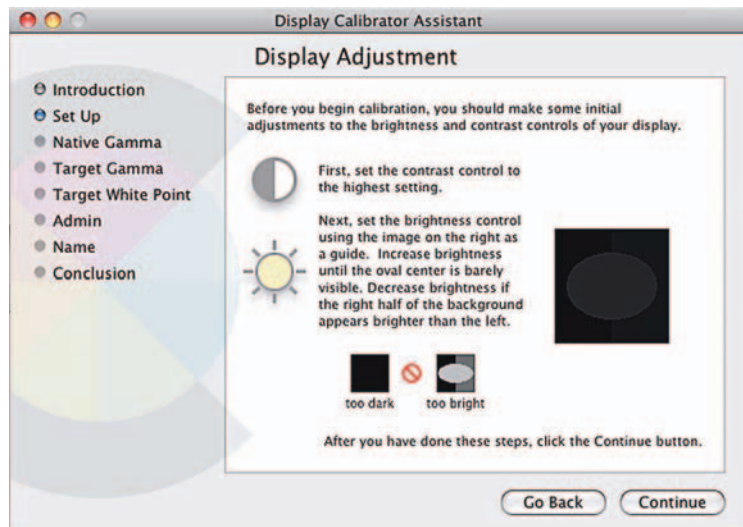
In Windows, Adobe Photoshop comes with Adobe Gamma, for similar adjustments.

Some displays "drift" from time to time and need to be re-calibrated after use. This is



not as critical with flat-panel liquid-crystal displays (LCD) as it is with those large cathode-ray tube (CRT) monitors. CRTs have red, green, and blue color guns that self-destruct with use.

Another means of calibrating a monitor and automatically generating a profile is less subjective. Please see pages 176 & 177. 🌸



See All the Color

You'll never know whether you have a great shot until you have a great LCD display.

Once you have a great display, you need to set up your software applications to take full advantage of it, or you won't see all the color that you need to view.

Luminance

First, you need to know some of the technical jargon that goes with display technology.

"Luminance" is a photometric measurement of luminous intensity's density. It's the amount of light that is emitted from a specific measured angle. The unit for measuring luminance is expressed in candelas per square meter (cd/m^2).

What's a good luminance? Unless you're in a very bright work environment, 120 to 150 cd/m^2 is a good "working luminance." You might hurt your eyes if you watch a display for a long time at higher luminance values.

Display Resolution

This is a misleading term. It sounds like it's going to tell you something about how sharp the image is. It's a measurement of the columns and rows of pixels.

Dot Pitch

Here's the real resolution: your display is just a series of red, green and blue dots, known as "subpixels." You want to know whether the screen image is sharp.

The distance from one red subpixel to the next is measured in millimeters. The smaller the number, the closer the spacing. Generally, tight spacing relates to a sharper image.

What's great? Some of that is relative to screen resolution and screen size. For a 25.5" screen with a resolution of 1,920 x 1,200, a dot gain of 0.287mm is sharp. 0.27mm offers a crisp image on a 21.3" display with a resolution of 1,600 x 1,200.

Gamut

This is where it gets not only interesting but extremely relative to image-making.

If you have not read about color gamuts and working spaces on page 154, please do that now.

To understand how gamut relates to your color workflow, you need to wade through some additional terms that are important for what you do. This is where the display's specifications tell you what percentage of the colors you need can be seen.

ISO Coated is a color profile. Instead of a generic CMYK profile, this one is relative

to the CMYK colors that appear on a glossy paper stock. If a display can show 100% of these, it's an excellent choice.

Adobe RGB is a big deal. That's a big gamut. Being able to see 95% of that gamut is quite impressive.

NTSC refers to video as does EBU. These are the broadcast standards of the National Television Standards Committee and the European Broadcasting Union. These standards get into areas of chromaticity, the quality of color, based on specifications for each of the RGB colors. Your display should be able to provide 100% of the EBU gamut. The NTSC standard is tough. If your display can show at least 90% NTSC, it's the one to grab.

Color Management Settings

Some users are so anxious to dive into a new software application that they fail to take care of the color settings and never get back to them. Don't let that be you.

The individual Adobe applications have color management setup under Edit > Color Settings. If you are in Creative Suite, synchronize all of your Adobe apps in Bridge.

Corel Painter's color management window is under the Canvas menu. 🌀



Calibrate a Monitor

Color professionals demand more than what ColorSync or Adobe Gamma have to offer. Those software applications are better than nothing, if that's all you can afford. They have one flaw: you. They depend on your perception of color.

A hardware display calibrator removes the subjectivity from the equation. You can get up-to-the-minute precise measurements directly from your displays' screens and pump them right into the dedicated software that creates the profile that your computers need. It calibrates everything in your workflow.

Calibrators were once high-priced luxuries. Now, some are less than \$200. Anyone making important decisions about image quality needs one of these.

Our clients have them. Because their displays are calibrated, so must ours be. That way we know we are all looking at the images the same way.

The calibration process is fast. You get it started and walk away.

What Hardware Calibrators Do

Some hardware calibration devices allow you to measure all sorts of different displays.

If you have various brands of monitors, this might be a good choice. They can create profiles for both LCDs and CRTs.

Some display manufacturers have calibrators for their own products.

Is there a difference? Yes there is. Both of them generate the ICC profile. What do they do to the hardware?

The calibrators that come from the display manufacturers often adjust the display to attain the desired white point and gamma. The ones from another source get into your computer's graphics card.

How Do They Do It?

It's easy. The calibrating device is held onto your screen with little suction cups, right in the center of the screen. It connects to your computer's USB port. The provided software runs the display through a series of screen images of precise tones and hues, while the calibrator reads what the display is showing it.

Visually Ergonomic Conditions

Now that you have a great display, there's one more thing that prevents you from seeing your images at their best: the place where you view them.

Under some conditions light floods onto your screen. You not only have screen glare, but you may have light of conflicting color. Your display needs a hood. They're available for studio displays as well as laptops. 🌿



Under the LaCie Blue Eye.



Control Print Color

Your printer came with a standard driver. It communicates with your computer's operating system and lets the software applications know that it's in the neighborhood. You tell the computer to print something. The driver sees to it that a piece of paper comes out of the printer.

You need more.

You need a profile of all available print media that you run through that specific printer.

Profiling Print Media

As we cover in the final chapter of this volume, there are some exciting print media options that make your work come to life.

If you have not discovered that there's more to it than the cases of ink jet paper that the office supply store sells, your photos are living a life of sorrowful neglect.

If printing on canvas is not enough to get you excited, check out fine art papers, velvet finished, satin, fiber-based matte, and a host of others. They come in gloss and luster, white and natural. It's even better than all of those darkroom papers of decades ago.

Each one of those textures and colors need to hand off special instructions to the printer if it's to understand how to treat it properly.

Most of these profiles are available from the paper supplier. Others work with some of the canned profiles for papers that the printer manufacturer sells.

It's somewhat intoxicating. Collecting the papers and profiles gets to be like collecting a library of typefaces, you can never have enough. They spark your creative engines, imagining what you can do with them.

Printing with Results

After downloading and installing your profile, when you open the Adobe Photoshop print window, make sure Color Management is selected, to the far upper right.

Be sure that the radio button for Document is chosen, instead of Proof.

For Color Handling, let the software application determine the colors. In an application like Photoshop, the app is able to best convert the image rather than letting the printer handle it.

Next to Printer Profile, all your new print media options appear.

Chances are that the paper that you have selected can print to more than a single dpi option. For great paper with great results, 2,880 dpi could be your best choice.

Following that is a choice that confuses some. Rendering Intent offers you:

- **Perceptual:** This is a good choice if your colors are out of gamut. It has to change some of those colors, but it brings them around to something close to human visual perception.

- **Saturation:** This may not be your best bet for natural color rendition. It's going to distort your color accuracy and pump up the vivid qualities of the image.

- **Relative Colorimetric:** Many image-makers prefer this choice. It preserves the colors the most faithfully. It shifts the white point of the image's color space to that of the profile's.

- **Absolute Colorimetric:** This tries to preserve the colors of the image first, and adjust them for the output second. The color results do not always appear in balance, but work well for proofing.

Once you have clicked on Print, you get another window. In it, be sure that you have the proper printer chosen.

Where it says Layout, go for Print Settings. Find your Media Type from the profiles. Under Mode, click on the Advanced radio button, and a few extra options appear. For your Print Quality go with the best option on great paper.

Now go back up to where you chose Printer Settings and this time, choose Color Management.

Selecting the radio button for Off (no color adjustment) prevents the printer from messing with your image. The software application can best deal with it.

Learning to Light from Prints

Evaluate the print. Ask yourself how the dynamic range has held up. What has happened to the highlights? Have the details held well in the shadow areas? What about the color?

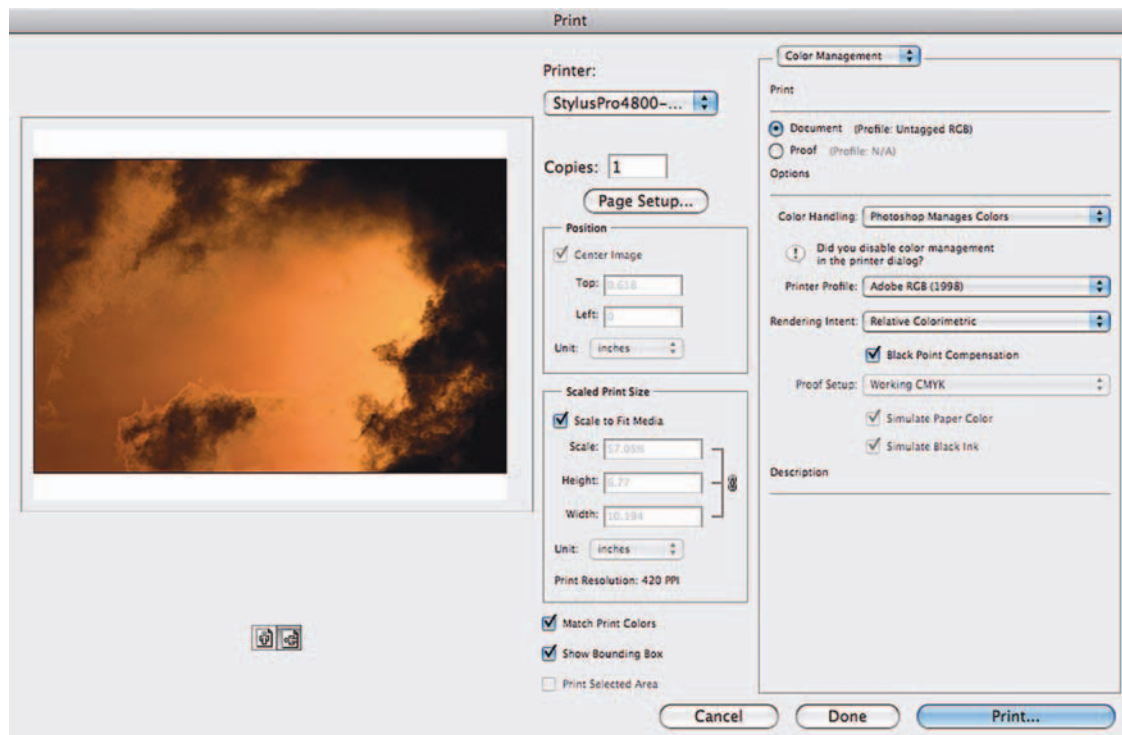
Each paper will do something different. Compare this print to other papers. Keep this in mind before you shoot. If the end-result is a print project, light and compose according to the end-result.

CMYK?

Don't be fooled into thinking that you need to print from a CMYK file.

Yes. Your printer is a CMYK output device. No. This doesn't mean you should convert the image to CMYK mode. The software

application makes the RGB to CMYK adjustment for you, as it's being sent to print. If you print from a CMYK file, it will have made the adjustment twice. 🌻



On Location with Cameras

Admittedly, being on location with cameras is a bit disconcerting. We have lenses worth as much as \$1,500 that easily drop into a purse or shoulder bag.

So much happens during a shoot. Some of the people, on our crew, we have known for quite a while. It's rare that we do a shoot where we're not working with some new people, too.

Some location photo sessions are in public places. We almost always have one setup in one place and at least one other setup somewhere else.

We have four digital single lens reflex (dSLR) cameras and twenty-two lenses.



To make a great shoot work, we need to interchange the lenses often. The more optical variety that we can inject into a session, the more sellable images we walk away with. That means we need to think through which lenses are going to work with which setups. As discussed earlier in this chapter, we figure out all that during the scouting session. Then, we need to have those lenses by our sides.

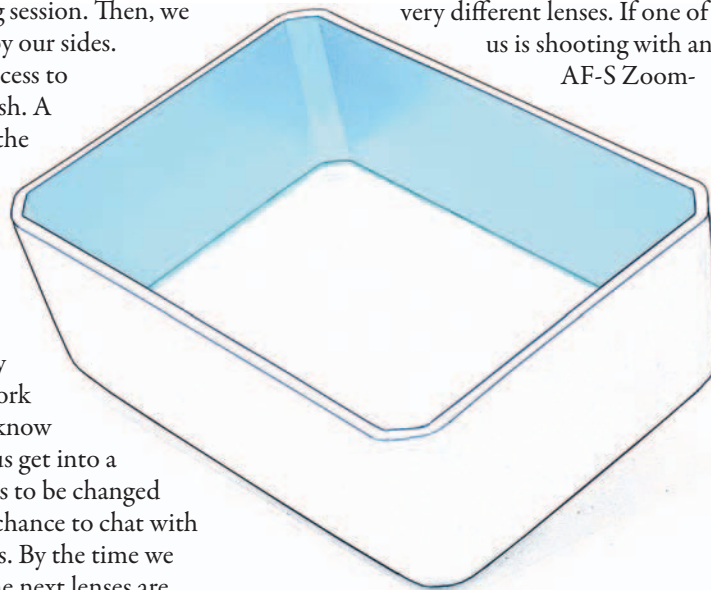
In studio, this instant access to lenses is easier to accomplish. A little rolling cart becomes the lens table.

It's helpful when we have assistants by our side to hand us our next lens, on demand. After working with the same assistants, again and again, they become used to how we work and begin to instinctively know how we shoot. This helps us get into a rhythm. When a lens needs to be changed out, that might be a good chance to chat with the talent for a few seconds. By the time we get back to our cameras, the next lenses are mounted and we're ready to go.

The Setup

We work one of two ways on a photo session, depending on how much talent is on hand.

Sometimes we double-light a set. We have two completely different lighting styles. The talent begins to perform while the two of us are shooting from different angles and with very different lenses. If one of us is shooting with an AF-S Zoom-



A Lightware case has a solid, unbroken form. This makes it all the more difficult for impact to intrude upon the case's mission-critical contents.

Nikkor 28-70mm f/2.8 IF-ED then the other might have an AF Zoom-Nikkor 80-400mm f/4.5-5.6D ED. The photographer that's working wider is closer to the talent and the one that's gone telephoto is back a distance. If all goes well, the wide shooter is out of the telephoto photographer's angle of view. The wide shooter can become the director, while the photographer that's back a bit can shoot for a while in silence.

When it's time to interchange lenses, it's best to have the appropriate carry cases near our feet.

The other way we work is for each photographer to be working in a completely different setup and we rotate talent between the two. It depends on the talent, assistants, and locale.

The Care and Feeding of dSLR Systems

Dust is an enemy of the dSLR camera and its photographer. When there's dust on the sensor it appears on image after image. The best solution is to leave a camera without a lens or body cap for just a few seconds. Another precaution is leaving a lens without a back cap for just a few seconds, too. Dust

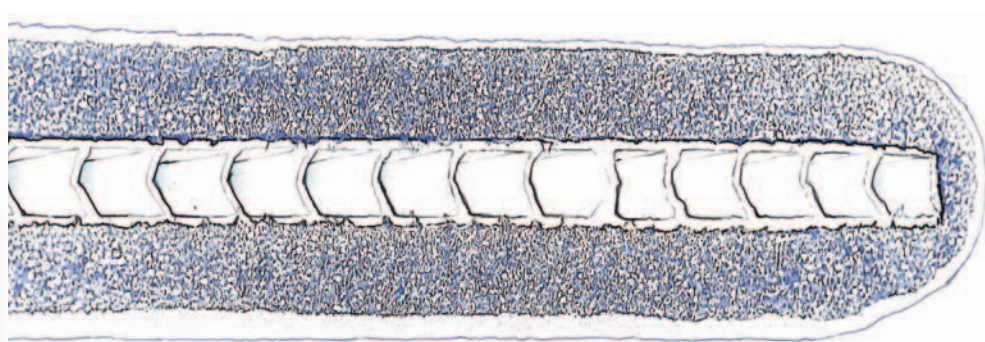
on the lens is a good way for it to get into the camera body.

Make your studio into a fire station. Pull your photographic fire truck out and clean it up after every shoot. Don't wait for the next fire alarm to prepare your gear.

Clean the lenses. Immediately recharge the batteries. Charge the batteries again, right before a shoot.

When on location, charge the batteries again, while on a lunch break.

Never let yourself run out of power. Camera batteries lose some of their charge, if



A case's armor is more than an exterior perimeter. Lightweight cases protect from collisions within the case, itself. Some components can easily damage their neighbors while being jostled. Strong, fluted dividers make all the difference.



left unused. Long exposures use more battery power. The more you use the camera's monitor, the more you drain down the battery.

Back at the studio, set up a little recharging station, where you can monitor when all the batteries are ready.

Should your cameras be out of use for a while (avoid that if possible), remove the batteries.

If you use an aerosol dust remover to clean the sensor and mirror, be sure to keep the can

vertical so it does not discharge any harmful materials that may come out when it's in a horizontal position.

Carrying Cases

We prefer soft luggage. The hard cases are nice, but they take up too much space for our liking.

Finding cases that are soft and rugged isn't easy. Paul Peregrine, an accomplished photographer and the president of Lightware, tells

us that they have tested the durability of their cases by loading them up with wine bottles and tossing the cases off the roof. We've never tried that but the point of Lightware's durability is a point well-made.

The inner core of the case is made of a plastic that's used for boat hulls. It's a solid mold material that's one continuous piece. Besides photographic and computer equipment, Lightware is used for medical, radar, and

surveillance equipment.

The Lightware MF2012 fits the size requirements for being brought onboard an aircraft. Though we prefer to ship things when traveling to distant lands, we cannot be separated from our computers and cameras.

Because adaptability is important, we like a case that allows us to rework the dividers to our exact needs. For those who like a case that

is very specific, this can be a bit unusual. Some photographers can be extremely creative behind the lens or at the computer screen, but need to stop and think about equipment that's extremely flexible, rather than the stuff that tells you the one and only way it can be done. The case that carried your second computer last week might work for the extra lighting equipment this week.

Keep your mind open. Be flexible. 🌀



On Location with Computers

The setup of the computer equipment on location becomes the nerve center of the shoot. It's where everyone gathers.

The CF cards are downloaded. Images are reviewed. Talent tries to catch a glimpse at how they're doing. The guardians of minors stand around and beam with pride.

If there's a client on site, it's where everyone monitors progress.

Securing the Location

Because there's so much equipment on site, and the digital assets are the dollars that drive our operation, part of scouting a site is discovering where we can set up everything in a place that if left unattended, would not allow an outsider to steal any of our stuff.

We look for some good counter space.

Everything needs to set up in a very organized manner.

A space free from direct sunlight is the best environment for viewing images.

What to Bring

Because we are creating remote workstations, there's always a need for at least two computers. We tend to prefer a Mac laptop and a Mac mini with a great display. That means that we are transporting a LaCie 321 with its hood. The laptop, of course, is self-protective in a good carrying case. The LaCie needs more tender love and care.

However, when it comes to judging images, the LaCie is a perfect size.

Some photographers transport an iMac with them on location. It's a display and a computer all rolled into one.

What's wrong with a laptop?

For some, it's a question of screen size. For others, there are issues about whether you can effectively judge images on them.



Our thinking is that it's close, but not quite close enough to provide that much-needed comfort level.

At less than 19" wide, a LaCie 321 easily fits into a rugged carrying case. The little Mac-mini stows away anywhere.

AC Power on Location?

What's the deal with photographers out on location with AC-powered computers?

It's true that battery-operated units are nice. The downside is that, for a half-day shoot, we arrive at 9:00 a.m. and strike by 5:00 p.m. For a full-day shoot, we might be in by 8:00 a.m. and out by 6:00 p.m.

Anything beyond ten hours just pushes everyone's endurance to the limits.

This includes laptop computers. Computer batteries don't hold out for ten hours while being driven hard, nonstop.

The other thing we must have is file storage. LaCie has some great Rugged Drives that run off of the computer's energy. It's a good solution for the short term, but for a big shoot, it won't work.

On a half-day shoot, two of us knock out around 2,500 shots, to edit down to an average of around 1,250 usable photos. For a full-day shoot, the energy level drains on the back-end so maybe we get 4,500.



At 19.2 megabytes per image, 4,500 images translates into 86.4 gigabytes.

On location, for a few days, we can easily accumulate 200 to 300 gigabytes. Two external hard drives are preferred for backups.

Each workstation has CompactFlash (CF) memory card readers to keep the download process going.

For safety, multiple hard drives should travel in separate bags. In case something happens to the main drive's bag, the backup drive is not traveling with it.

Going on location for more than one day demands a Wacom graphics tablet. A Cintiq is ideal, because it's also a great display. A 6" x 11" Intuos 3 easily stores in a case.

It satisfies those urges to start working with the images back in the hotel room. That's where having a serious display on the shoot, is a dream. Additionally, to keep our business

humming with other project files, the LaCie Ethernet Big Disks are something we have to have with us. Sometimes, location shoot days are not consecutive. 🌿





On Location with Lighting

Lighting on location is such a broad and diverse topic.

On one side, there are the tiny components of the Nikon Speedlight R1C1 Kit. The other side is the massive Matthews Boom Junior and its counterweight.

They are all perfectly engineered for a very specific need.

So many of these lighting components suit the needs of one person toiling away by themselves. Whether you're working with a team or alone, none of what we use requires more than one person.

Moving the Stuff

In a big shoot, getting all the lighting from Point A (usually our vehicles) to Point B (the location) and back to Point A is no small effort. Just getting everything from the studio into the vehicles takes a little doing.

However, for the small shoot, everything is grab-it-and-go.

We have to be prepared if we hear that a great shot is available, know right where the



Get creative with how you organize a Lightware case. The unique divider system encourages you to arrange all your gear into a layout of your choosing. Each of the Multi Format cases (above) comes with a set of dividers

which are covered with a hook and loop foam-backed tricot and include a generous hand-full of strips with adhesive-backed hook material, allowing you to precisely setup the case's partitions to securely hug each item.

right tools for the right job can be found, and seize the day.

Keeping It Organized

It's not all a location thing for some of us. At times, we are studio-bound. For our company, tough winters in the Northeastern and mid-Atlantic United States means a few weeks of shooting primarily indoors.

Though we shun overpriced gear, the sum total of our complete studio is well into the six figure range and needs to be handled and stored with care.

Beyond the cost, it's imperative that everything works at optimal levels when we get it out and set it up. Our equipment choices nearly never let us down, as hard as we drive it to extremes. Most of the brands of equipment that we shoot with go back to at least 1981. We stick with what we know and trust.

Cases of gear are not just about location. It's how we account for our equipment assets. We keep it safe, clean and organized, whether out-and-about or by the home fires.

The Lightware Cargo Cases (right) are perfect for long stands, booms, supports, or backgrounds. The flip-lid stays open and out of your way when loading and unloading. We can also place dividers in this one and it's perfect for nine Novatron Bare Tube Heads with their reflectors attached.

Compact Unity

Even with the big toys, we try to keep the lighting to the smallest and lightest weight possible.

Sometimes, the children of our friends and talent want to join in and help. All the flash heads, HMIs, light banks, and most of the support gear we use is light enough for an eight-year-old to carry.

Once you get out and set up a location, you have equipment all over



the place. When a shoot runs late and you're enjoying the light of that sweet golden hour as the sun is disappearing below the horizon, you now need to find all the hard assets. Having a packing order is essential.

When we look at a case, we know if everything that's supposed to go back in it is there. We have an inventory list of what goes where. As long as the contents of the case don't change, we're in good shape. If we have to pack a case to suit a specific job, greater attention is needed when we strike.

Our preference is toward smaller cases, rather than tossing everything into large cases. This does require more trips from point A to point B and back again, but it fits more cases into a car and it keeps our backs healthy.

Lighting Precautions

Whether you are on location or in the studio, the handling of lighting instruments requires certain care.

In cold weather, turn on the flash head's modeling lights for a little while. This warms the flash tube assembly.

Don't allow your skin to touch the lamps for HMIs or the flash's modeling lights. The oils and acids on your skin can reduce the life of these special lamps.

Water and electricity don't mix. Nevertheless, shooting around pools and fountains makes for some great photography. Keep all cables away from the water. As we get into in more detail in Chapters 9 and 13, securing and weighting lighting outdoors takes top priority. Around water, you need to be on a heightened state of alert. Think through every possible eventuality.

No matter how good your preproduction planning may be, things go wrong. Keep a cool head. Don't allow yourself to become flustered. That's when things really go wrong. If you're not at ease, everyone else feels it. People need

to be in good spirits if you're going to capture great images. It's up to you to be firm, but to lead the team with plenty of positive energy. 🌸

Lightware Slings (above) are perfect for tripods or stands. They're great for fast on-the-run set ups.





Location Responsibilities

An awful lot has to happen on location that has nothing to do directly with making photographs. Taking care of everyone and everything is of great importance.

It hurts us to hear that a photo shoot had previously happened at a location that we want to use and everyone was left with a bad feeling about it.

Crafts Service

There's a need to keep everyone hydrated and nourished. The motion picture industry has union rules about how everyone needs thirty to sixty minutes for a hot meal every six hours. This has become incorrectly known outside the film world as "crafts service."

Of course, we're not a union shop, but we like to have plenty of spring water and organic foods to keep everyone's energy levels up with healthy eats.

If people wear out, the shoot is not as productive as possible.

Minors

Some children are real troopers to work with. When it's show time, they turn it on. We have to balance that with the realization that their attention span will last for only so long.

We encourage their guardians to get them away from the set for a time, to take a break and have some family time before coming back. It's good for everyone. After a while, some of these wonderful children begin to welcome you into their world and everyone has a great time. It's a team effort that has more rewards than the photos.

Children are our favorite return talent. We document their growth, year after year. Some of the images that we create of them are worth a fortune to their families already. We know that in a few decades, these images cannot have a price placed on them.

Model and Property Releases

As loving and caring as we are, from time to time, sadly, someone who had a great time on the set gets greedy later.

Assume nothing. Every once in a rare while, somebody thinks that because you are in the media, you have money coming out of your ears. (Whenever we look in the mirror, we can't spot a single dime in or behind our ears.) Always get it in writing, up front.

Not a single image is exposed of anyone until they sign a model release. We setup a notebook with the releases in them. We fill

out as much as possible in an Adobe InDesign template and print it before the shoot, so that they or their guardian can just sign their names and write in any missing information.

Don't even schedule a shoot without a signed property release form. The day of the photo session is the wrong time to get clearance to shoot. By then, you could have a cast and crew of a few dozen people hanging around, with a few vehicles filled with gear, waiting to get to work, and nowhere to make the photos.

Strike

We find it rewarding to leave a location in better shape than when we loaded in. We try to strike the set an hour before load-out is to be complete. We don't like to overstay our welcome. Many people revel in a fun shoot. They like to be part of the good times. It's nice to shoot where we know we are welcome to return at some point in the future.

Keeping everything organized is the key to leaving nothing behind. If every case has a specific compartment for every piece of gear, it's easy to look at each case and know that it has nothing missing before it is zipped up. 🌸

M² Media Studios, Inc.
MODEL RELEASE: ADULT

DATE _____
PRODUCTION # _____
MODEL RELEASE # _____
PHOTOGRAPHER(S) NAME(S) _____
DESCRIPTION OF SHOOT/PHOTOGRAPH _____

ATTACH
HEADSHOT
HERE

In consideration of payment for my services as a model, receipt of which I acknowledge, I hereby agree as follows:

- I hereby irrevocably grant to M² Media Studios, Inc., its parents, subsidiaries, affiliates, agents, successors, assigns, and licensees (hereinafter collectively referred to as "M²"), the absolute and unconditional, worldwide right, in perpetuity, without right to further payment, to use, reuse, transmit, display, sell, license, copyright, and publish my portrait, likeness, picture, image, and name (collectively "My Likeness") in any photographs, images, recording, footage, video, art, or illustrations (collectively "Images"), without restriction, in any media now known, or hereafter invented, including without limitation, art, advertising, stock photography, stock video/footage, stock film, digital or electronic media, print, broadcast, internet, promotions, commercial and non-commercial use, or for any other purpose throughout the world.
- I agree that the images may be combined with other images, text, and graphics, and cropped, altered, or modified. I waive all right to view, inspect, or approve any product, text, advertisement, or any other use of Images that contain My Likeness in any and all media.
- I hereby irrevocably agree to forever waive and release any claim that I or my successors or assigns have, or may have, against M² or the photographer based on any rights of privacy, publicity, or any other right that may arise from, or be related to, the use, license, modification (including blurring, altering, or distorting whether intentional or otherwise), distribution, publication, or reproduction of My Likeness in any and all media.
- This Model Release is for the production described above and all other prior productions. This Model release may not be changed or modified orally, and I agree that this writing represents the entire understanding between myself and M². I further acknowledge that M² may assign its rights under this Model Release to any third party.
- If any provision for this Model Release is determined by a court of law to be invalid, void or unenforceable in any jurisdiction, then (i) the Model Release shall be construed so as to effect the widest possible grant of right without violating the law of the jurisdiction. Any dispute related to this Model Release shall only be brought to the parties in the Federal Courts of the Commonwealth of Virginia, United States, which courts shall have exclusive jurisdiction over any matters related to this Model Release.
- I represent and warrant that I (i) am of full age in the jurisdiction in which the Model Release is executed; (ii) am of full legal capacity; (iii) enter into this Model Release voluntarily; (iv) have not granted any rights that conflict with those granted herein; and (v) have every right to contract in my own name and grant the rights herein. I have read this Model Release, prior to its execution, and agree with its terms.

MODEL'S NAME _____ MODEL'S TAX ID OR DRIVER'S LICENSE # _____
DATE OF BIRTH _____ MODEL'S E-MAIL _____
MODEL'S ADDRESS _____
MODEL'S PHONES _____

Ethnicity information is requested for descriptive purposes only, and serves as a means of providing more accuracy in assigning image search words.
Mark each that applies to the model:
☐ Asian (please specify): _____
☐ Middle Eastern ☐ Mixed Race (please specify): _____
☐ Hispanic, Latin ☐ Caucasian, White ☐ African American ☐ Native American
☐ Other (please specify): _____

WITNESS SIGNATURE _____ WITNESS PRINTED NAME _____
WITNESS ADDRESS _____

M² Media Studios, Inc.
MODEL RELEASE: MINOR

DATE _____
PRODUCTION # _____
MODEL RELEASE # _____
PHOTOGRAPHER(S) NAME(S) _____
DESCRIPTION OF SHOOT/PHOTOGRAPH _____

ATTACH
HEADSHOT
HERE

the Parent or Legal Guardian of the minor named below. In consideration of payment for the minor's services as a model, receipt of which I acknowledge, I hereby agree as follows:

- I hereby irrevocably grant to M² Media Studios, Inc., its parents, subsidiaries, affiliates, agents, successors, assigns, and licensees (hereinafter collectively referred to as "M²"), the absolute and unconditional, worldwide right, in perpetuity, without right to further payment, to use, reuse, transmit, display, sell, license, copyright, and publish the minor's portrait, likeness, picture, image, and name (collectively "Minor's Likeness") in any photographs, images, recording, footage, video, art, or illustrations (collectively "Images"), without restriction, in any and all media now known, or hereafter invented, including without limitation, art, advertising, stock video/footage, stock film, digital or electronic media, print, broadcast, internet, promotions, commercial and non-commercial use, or for any other purpose throughout the world.
- Images may be combined with other images, text, and graphics, and cropped, altered, or modified. I waive all right to view, inspect, or approve any product, text, advertisement, or any other use of Images that contain the Minor's Likeness in any and all media.
- I agree to forever waive and release any claim that I or my successors or assigns have, or may have, against M² or the photographer based on any rights of privacy, publicity, or any other right that may arise from, or be related to, the use, license, modification (including blurring, altering, or distorting whether intentional or otherwise), distribution, publication, or reproduction of the Minor's Likeness in any and all media.
- I agree that the entire understanding between myself and M² is for the production described above and all other prior productions. This Model release may not be changed or modified orally, and I agree that this writing represents the entire understanding between myself and M². I further acknowledge that M² may assign its rights under this Model Release to any third party.
- If any provision for this Model Release is determined by a court of law to be invalid, void or unenforceable in any jurisdiction, then (i) the Model Release shall be construed so as to effect the widest possible grant of right without violating the law of the jurisdiction. Any dispute related to this Model Release shall only be brought to the parties in the Federal Courts of the Commonwealth of Virginia, United States, which courts shall have exclusive jurisdiction over any matters related to this Model Release.
- I represent and warrant that I (i) am of full age in the jurisdiction in which the Model Release is executed; (ii) am of full legal capacity; (iii) enter into this Model Release voluntarily; (iv) have not granted any rights that conflict with those granted herein; and (v) have every right to contract in my own name and grant the rights herein. I have read this Model Release, prior to its execution, and agree with its terms.

MODEL'S NAME _____ MODEL'S TAX ID OR DRIVER'S LICENSE # _____
DATE OF BIRTH _____ MODEL'S E-MAIL _____
MODEL'S ADDRESS _____
MODEL'S PHONES _____

Ethnicity information is requested for descriptive purposes only, and serves as a means of providing more accuracy in assigning image search words.
Mark each that applies to the model:
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☐ Hispanic, Latin ☐ Caucasian, White ☐ African American ☐ Native American
☐ Other (please specify): _____

WITNESS SIGNATURE _____ WITNESS PRINTED NAME _____
WITNESS ADDRESS _____

WITNESS SIGNATURE _____ WITNESS PRINTED NAME _____
WITNESS ADDRESS _____

Kodachrome
FILM



Kodalux
PROCESSING SERVICES



Raw Files and Scanned Films



If you've been smart, in preproduction, your shoot should yield great results. Then, the magic becomes evident in postproduction.

With great raw files and films, it's as if you can go back and redo a successful shoot, a few different ways. Your results give a new dimension to your work. It also allows you to pull more out of an image, to suit a particular client's needs, or revisit a few minor issues that did not work as perfectly, as planned.

In the emerging digital environment, we want to feel as if we are discovering something as fresh and new as the first snow drop crocus, to appear, for the season. Like the crocus that appeared, from a bulb, in that exact same spot, last year, some of these techniques are not completely new.

Many of these image processing tasks were once the purview of skilled scanner operators, at pre-press houses, who prepared images, for publication, on very expensive drum scanners. It's the only thing that they did, all day.

Now those tasks are in your hands. You need to be just as good as those craftspeople.

It takes plenty of study and practice to bring the most out of an image. Keep at it, daily. If the raw image is a tune that you hummed in your head, postproduction is the resulting symphony.

What you do with Adobe Camera Raw, or your scanner's software, should dramatically reduce the amount of time the image needs in Adobe Photoshop.

Work smart. Use these tools to not only produce fabulous results, but to manage your time wisely. 🌸

Bridge: The Metadata

The start of postproduction is something of a postmortem on the photo session.

In Bridge there's a great deal of metadata available to tell you exactly what you did with each image and even some information on how you went about doing it.

In the world of mechanical cameras with their manual exposure and manual focus, as pictures were made, some photographers diligently noted their f-stop, shutter speed, and other technical data on a little note pad that traveled with them. Think of the metadata, that the camera is capturing for you, as your personal scribe.

Get out your scribe's notes after the shoot and compare them to the images. It's part of your life-long learning process.

Exif Data

The Exchangeable image file format (Exif) goes back to the late 1990s and the Japanese Electronic Industries Development Association. These metadata tags are used by nearly all camera manufacturers. They include such data as the date, time, lens used, focal length, equivalent focal length in 35mm, aperture, shutter speed, ISO, the metering mode, sub-

ject distance, and even the camera's model and serial number. Exif covers a total of forty-one items that can be viewed in Adobe Bridge.

In Bridge's Preferences window you can choose to view as many of these as you like.

XMP Data

The Extensible Metadata Platform (XMP) was introduced by Adobe Systems in 2001. Three years later, a collaborative effort was developed with Adobe, Agence France-Presse, Associated Press, the International Press Telecommunications Council, Japan's Mainichi Shimbun newspapers, Reuters, and others, to begin development on the rich source of metadata that it is today.

Once you have manipulated the image, you want everyone to see it, just like the way you have made your improvements. The xmp file embeds the metadata in some image files, making it easier to share and transfer images, regardless of what kind of computer operating system and software others use to view them. Now that the xmp data is there, the raw file is viewed in Bridge with your adjustments.

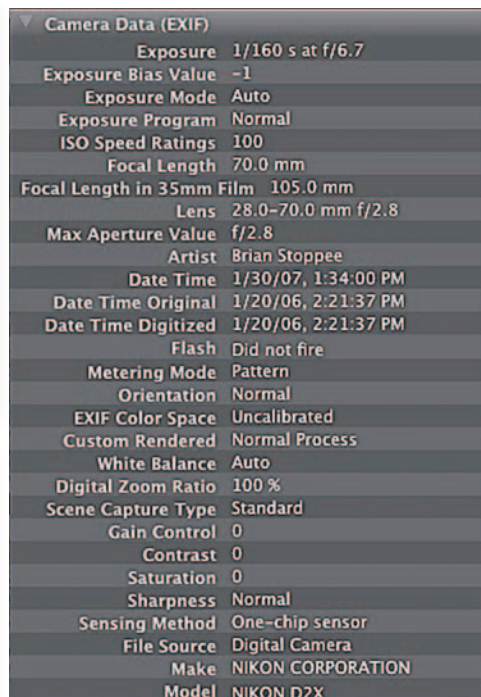
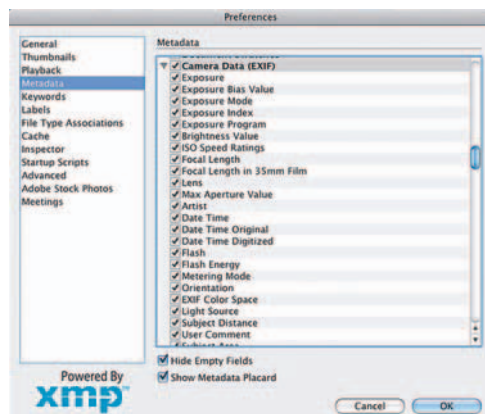
Camera raw files remain unblemished even after you go into Adobe Camera Raw

and make alterations. The wmp file remains separate from the raw file. However, if you send someone both the raw file and the xmp, when they view it in Bridge, they will see it as you did after reworking it in Camera Raw. In this case, Bridge truly lives up to its name, spanning a pathway between you and someone viewing your raw files somewhere else on the planet.

The Critique

Review the shoot in Adobe Bridge. Use Bridge's loupe to examine photos at 100%. Look at the exposure choices that you made in Bridge's metadata panel. Look over a set of images and consider your focal length choices. Is the depth of field expressing what you hoped to say? Did you light the scene the way you wanted it? How did you do with the details in the shadows and highlights?

Now open them in Camera Raw and see what you can do with them. Let us guide you through many of the most successful ways in the postproduction processing of raw files, over the next twenty-six pages. 🌸



Start with your Preferences box, in Bridge (upper left), and check the metadata that you want to see.

Then, carefully examine what the data is telling you. In these samples, we are looking at data from a tif. Displayed is both the information on how it was created in camera, as well as some of the post-production information from what we did with it in Adobe Camera Raw.

The Raw File Advantage

Working with raw files takes a bit of mental adjusting. In file formats like Photoshop's psd, the tiff, or Corel Painter's riff, we think in terms of doing something to the file.

With a camera raw file, it's not what we do to it; it's what we do with it.

Nondestructive Image Processing

With a psd, riff, or tiff, we are used to making alterations to the image, and what is done is done. Unless we have made a copy of the image, it is changed forever.

You can't change a camera raw file directly without ruining the image's rawness, from which there is no turning back.

The raw file itself has no value as a finished image for print or web usage. These files are the proprietary formats of the camera manufacturers. They need to be converted into another format to have universal acceptance.

The nondestructive nature of this is good news, in the sense that it is much like the digital version of transparency film. You can scan the slide. You can make inter-negatives of it. You can print directly from the transparency,

but once the photo lab processes one of these iterations, it is what it is; that story's over.

One of the many beauties of the camera raw file is that the actual photo as shot remains preserved. The "oops!" factor is removed. Years from now, you can pull it up and create new variations on it with some new technology, just as you can do with the slides you shot a few decades ago.

It's Gotta Be Good

As previously mentioned, if you shoot a lousy photo with terrible exposure that is significantly out of focus, camera raw is not going to rescue you from your imprisonment in the castle. There are still no knights on white stallions for bad images.

For Adobe Camera Raw to perform well, you have to start with a good photo.

Change Your Mood

The Adobe Camera Raw plug-in for Adobe's After Effects, Bridge, Lightroom, and Photoshop permits you to not only take one image and bring it to production perfection, but

also allows that one image to take on many lives. It's as if you made a series of variations by releasing the shutter once.

Just as the quality of light at sunrise is different at the same location at noon and again just after sunset, Adobe Camera Raw allows you to change the color of the image in postproduction.

Developed and regularly updated by Thomas Knoll, the founder of Photoshop, Adobe Camera Raw offers the white balancing, vibrance, hue, luminance, and saturation options that provide the tools for you to create new moods of light.

Better Than jpg or tif?

As previously discussed, some photographers shoot directly to jpg or tif. For the folks with the jpgs, there's no turning back. There's a little more room with a tif, but if major correction is needed, such efforts are a longer shot. The raw file, however, is your best chance for long-term alteration options. 🌸



The above image is at the color temperature at which it was originally shot. It's also in Adobe Camera Raw's (ACR) default settings.

The ACR postproduction, for the image to the right, was less than 60 seconds. The turn around is dramatic and worth every second for this heart warming photo of Katie and her father, Patrick.



The Adobe Camera Raw Environment

If you are new to Adobe Camera Raw or even if you have been at it for a while, please don't be intimidated. It's all quite simple. There's just so much to it.

Historically, when a photograph went to print, the film was pulled out of its mount and taped to a glass cylinder known as a drum, and the image was electronically acquired through a drum scanner (*we'll get into that more, starting on page 224*). The image was then separated to four total contrast films, with halftones for each layer of cyan, magenta, yellow, and black. The films, at the actual size they would appear as on the printed page, were then stripped into the rest of the big sheets of film that made up each of those layers, before being burnt to metal plates, one for each of the four process printing colors.

Scan operators worked the drum scanners all day long and were valued for their keen eye in bringing a photograph into perfect balance for print projects. They could look at an image, know what the end result needed to be, and manipulate the drum scanner's operation for prime results. There aren't too many of these people left.

Adobe Camera Raw offers far more control than the outrageously priced software for drum scanners once cost. Instead of the talented scan operator doing the work, you're in control. There's a great deal to learn if you are going to perfect this.

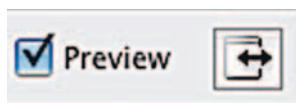
Unlike the scan operator, your projects may go out to more media than just the printing press, so you have even more to know.

With plenty of practice, if you have an eye for digital technology and creativity, you can master this.

Do you have a choice? If you're going anywhere with camera raw images, you have to become a pro at Adobe Camera Raw!

Getting Started: Full Screen Toggle

When you try to open a camera raw file in any of the Adobe software applications that link to it, Camera Raw automatically opens.



If the dialog box is too small, you can make it consume your entire screen for the biggest views. Do this with the "f" key or use the button that's to the left of the histogram.

Image Adjustment Tab Buttons



Here's a real quick overview of the image adjustment tabs, on the Adobe Camera Raw (ACR) dialog box. They appear right under the histogram that's in the upper right corner.

Basic: Here's where you do the majority of your work in ACR. You adjust your general color, exposure, lighting, and sharpness. Get to know this tab first. We get deep into this on pages 204–215.



Tone Curve: This is professional territory, but something you don't want to shy away from. Fine-tuning the tonality with both the parametric



and point modes provide big control. Please check out page 216–217.

Detail: This tab can save an image. Sharpening can pop out a few minor focus issues. Reducing noise can be critical to providing acceptable work. See page 218 for more.



HSL/Grayscale: Fine-tuning hue, saturation, and luminance individually, are fun enough, but this tab gives you the ability to call out just the portions of the image that fall into one of eight colors, which is extra-powerful. Plus, this tab allows you to convert to grayscale and then adjust the role each of those eight colors played in it. It's like a black and white filter kit. We've squeezed this information into pages 219–221.



Split Toning: Here's where you can manipulate the hue and saturation of just the highlights and shadows. Go to page 222, for more.



Lens Corrections: On page 82 we discuss chromatic aberration and on page 96, vignetting. Here's your chance to correct what the lens caused. Please go to page 223 for more.



Camera Calibration: You may find a difference between your ACR profile and your camera model. Adjust that here. See page 223, too. 🌸



Histograms in Camera

We dropped this topic into the Adobe Camera Raw (ACR) chapter because understanding histograms at the time the image is about to be made is as critical as adjusting it in postproduction.

You can discover much about exposure if you learn to read the histogram.

The histogram is another one of those things that we think the image-making industry invented. Historically, it refers to a common bar chart with columns of graphical representations of numeric data, such as how many women and men voted in the last election; each gender with its own column.

An image histogram is no different. It's the graphic representation of the grayscale values from 0 (black) to 255 (white).

The horizontal axis is the grayscale. The intensity of each grayscale value is represented in vertical height.

Where Is the Histogram?

We're familiar with how this works on Nikon dSLR cameras. We sometimes see the

histogram by accident when working with the multi selector. *(If you have another camera brand, please check your manual.)*

Once you have captured a test image, press the playback button (the arrow with a frame around it). Just tap the multi selector to the right. The histogram superimposes over the image. If you just shot a series of images, use the up and down arrows on the multi selector. As you page through the images, the histogram changes, too.

Tap the multi selector to the left to get rid of the histogram.

Expose to the Right

The best-case scenario for a histogram is to show that there's no overexposure or missing highlights and not too much underexposure, where shadow details are lost. In a digital environment, the latter could indicate noise.

One rule of thumb is that you want the histogram to shift a bit to the right. That's



Nikon Grayscale Histogram

showing you that you shouldn't have major concerns about overexposure.

You don't want the majority of the histogram's graphic to pile up against either side. Overexposures mass to the right. Underexposures mass to the left.

Don't concern yourself with the overall shape of the histogram. It's a representation of the overall tonal distribution.

Color Channel Clipping

In addition to the grayscale levels, you can check out what's happening with the color. Clipping is when details are lost.

On a Nikon, just one tap to the right on the multi selector, displays the grayscale histogram; two more taps gets you the RGB display of all three channels, shown separately, plus the grayscale in yellow.

Accuracy of Histogram with Raw Files?

We have heard it said that histograms on raw files are inaccurate. We have tested them on

our Nikon DSLRs, and the histograms are identical if we shoot raw, jpg-fine, or tif.

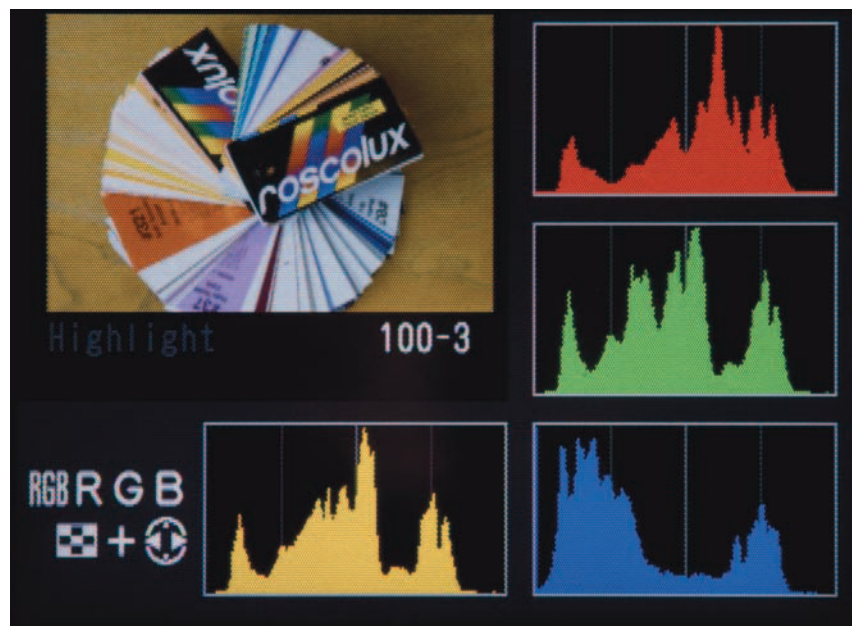
Blown-Out Highlights

Another cool thing that the camera's playback can show is whether you're blowing out highlights. Located between the playback page that superimposes the grayscale histogram and the page for the RGB histograms is a useful highlight indicator.

Try it. Shoot a bracket of five exposures, each one a full stop different

than the other, with the one in the middle on the money.

Now page through them and watch what happens to the highlights as you get to the overexposed images. The blown out areas flash to warn you of potential problems. 🌀



Nikon RGB Histogram

Histograms in Camera Raw

A histogram in Adobe Camera Raw (ACR), isn't any different than the histogram we just discussed on the previous two pages. It's a vertical bar chart that graphically expresses the number of pixels at each luminance level.

Usually, the goal is to have something for each luminance value. It shows that the image is taking full advantage of the complete tonal range. When a histogram doesn't show that the full tonal range is in use, it could indicate that the image lacks contrast.

One thing different about ACR's histogram is that it's live. As you make adjustments to an image, the histogram reflects the changes. Another is that it displays the RGB as one combined graphic.

When you see white, it means that all three channels overlap. If you see yellow, magenta, or cyan, then two of the RGB channels overlap. Yellow indicates red + green. Magenta shows red + blue channels. Cyan is green + blue, in the same space.

Exposure and Clipping

To see this in action, try moving the exposure slider in either direction. The histogram will rise and fall in either direction, too.

Now turn off the highlight clipping. It's the triangle to the upper right of the histogram. You can click on it or toggle it on and off with the "o" on your keyboard. Now, as you ride the exposure all the way to the right, the clipped highlights are indicated as red. Turn off the highlight clipping.

Turn on shadow clipping with the triangle to the upper left or use your keyboard's "u." Now slide the exposure to the left. Shadows that clip turn blue.

It's not always easy to immediately spot the reds and blues. Here's a neat trick: if you want to only see what is being clipped, hold down the "alt" key while you are making adjustments.

Be sure to click the Cancel button so that none of these changes affect your image.

RGB and Metadata

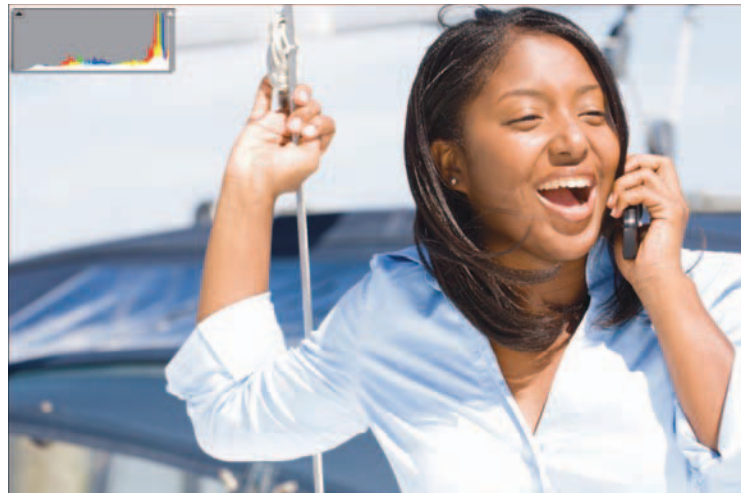
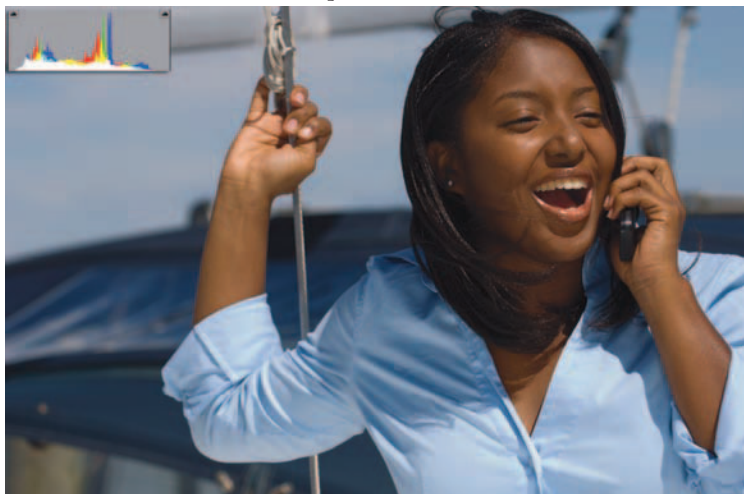
Move your arrow around the preview image. Notice what happens to the RGB data under the histogram. It's telling you the color values of what's under the pointer.

The metadata from the photo should help you in evaluating your exposure and focal length choices. That's to the right of the RGB information. If your shutter speed or aperture is not to your liking, ponder what went wrong with the illumination. 🌞



Above: Normal

Below: + 1-stop



Above: - 1-stop

Below: Clipping On



White Balancing

When you open an image, in Adobe Camera Raw (ACR), it shows you the white balancing that you set in the camera. In theory, all of this went well at the shoot and you're happy with the results. If you're not 100% pleased, that's not a problem, this is what ACR does well. Maybe you just need a little tweaking, or maybe you want to explore how to use ACR for various moods from one shot.

Workflow Options

At the bottom center of the ACR dialog box is a line that notes your image's color space, color depth, image size, and resolution. They are the current workflow options. To change them, click on that line. It determines how you view things in ACR.

You can see and change these workflow settings at the bottom of the Camera Raw dialog box.

The ACR color space should be the same one that you use for your Photoshop RGB working space. The incoming image's workspace should be the one selected on the camera. If your working space isn't there, choose ProPhoto RGB, and convert the file when you open it in Photoshop.

At first, the image size that ACR shows, is the dimension of the image, as captured by the camera. You can upsample or down-

sample, as discussed on pages 160 & 161. The suggested size is marked with an asterisk (*) in the size menu.

Choosing a smaller or larger resolution doesn't change the file size. The document dimensions are just altered. If the resolution is 72 pixels per inch (ppi) the document dimensions are large. At, 2,400 ppi, they are comparably tiny, but the file size and megapixel size remain the same. It's similar to Photoshop's image size dialog box with resample not checked: you can change the resolution and the document dimensions change, but the other options are fixed.

The Hand Tool

We wanted you to choose new workflow options so that when you select previewing at 100%, you can see the details of the changes you will be doing. In ACR, this is best viewed using the hand tool to navigate around the image.

Click on the hand tool at the top of the dialog box or use the "h" key.

Exploring Color Temperature and Tint

The temperature options offer presets of:

Daylight	5,500 K/+10 Tint
Cloudy.....	6,500 K/+10 Tint

Shade	7,500 K/+10 Tint
Tungsten	2,850 K/+10 Tint
Fluorescent	3,800 K/+21 Tint
Flash	5,500 K/+0 Tint

Adding tint tends magenta. Subtracting tint tends green.

White Balance Tool

There's another great way to choose color temperature. Choose the white balance tool that looks like an eyedropper half filled with gray liquid or use your keyboard shortcut, "i."

Color Samplers Tool

The tool to the right of the white balance tool helps you to collect color samples from around the preview image. You can collect up to nine of them. The readings appear under the tools, much like a digital color meter that measures RGB. You can also drag one reading to another location. Use the "s" key to access this tool. 🌻

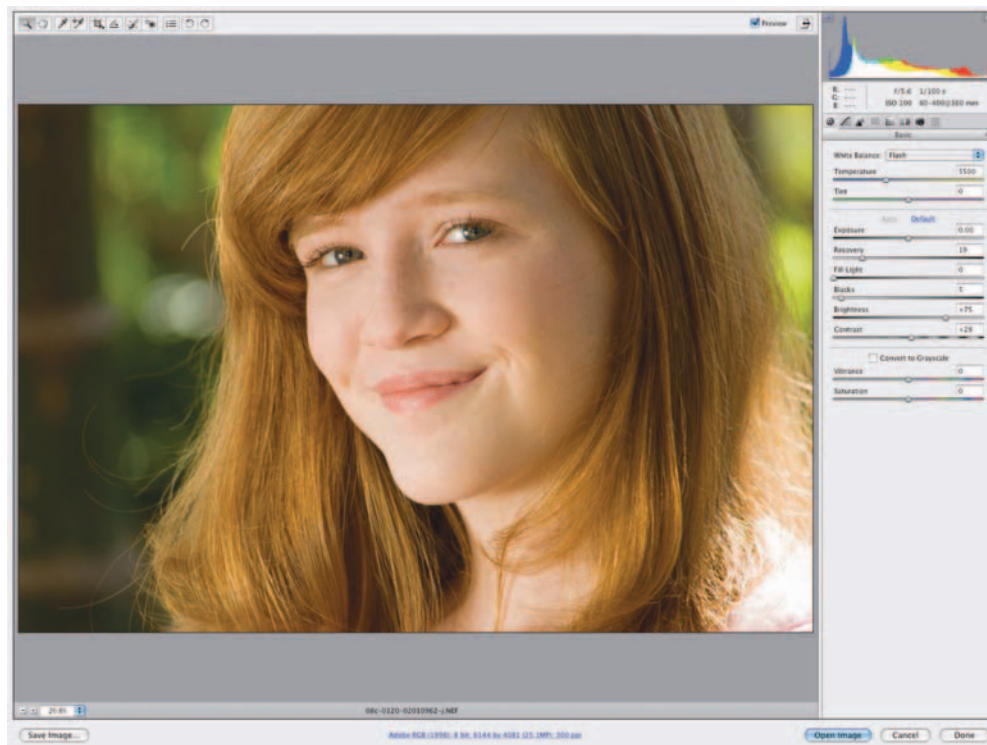
On the next two pages, review the variations on temperature and tint, for the image to the right.



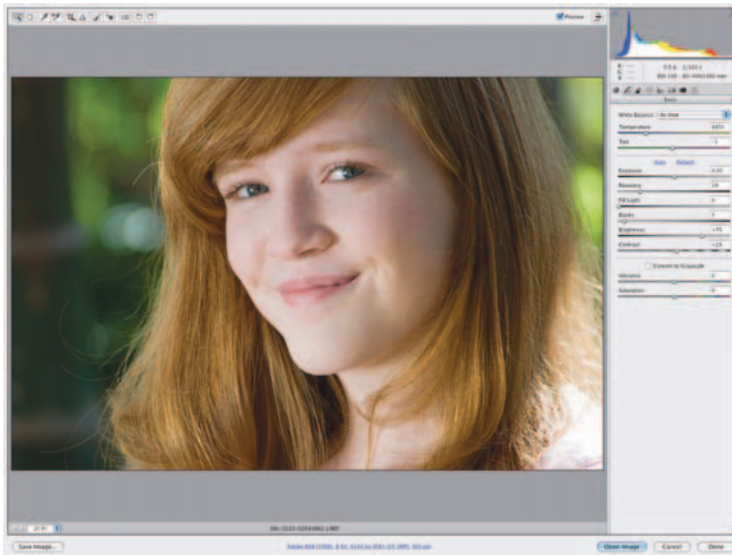
Temperature and Tint

Please use these tables and examples to further explore the possibilities of temperature and tint. Apply the same captioned numbers to your own images. Continue to work on how you can use these in developing new looks to a single image.

Remember that minor increments of color temperature changes are not perceived by the human vision. *(For more on this, please go back to the discussion of mired shift on page 121.)* 🌻

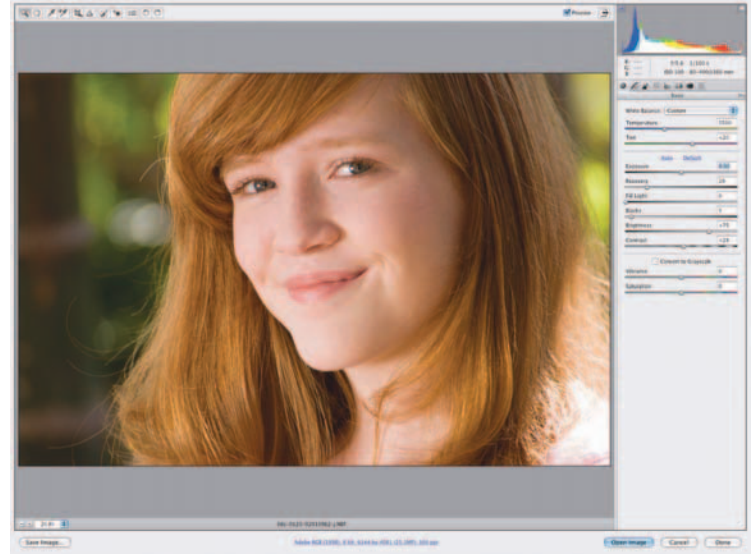
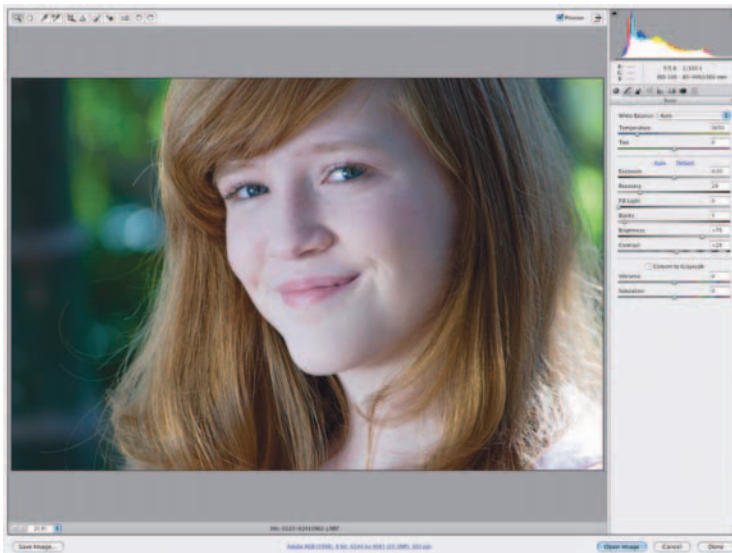


The above image matches the one we chose on the previous page. It's our choice. You may prefer one on the adjacent page.



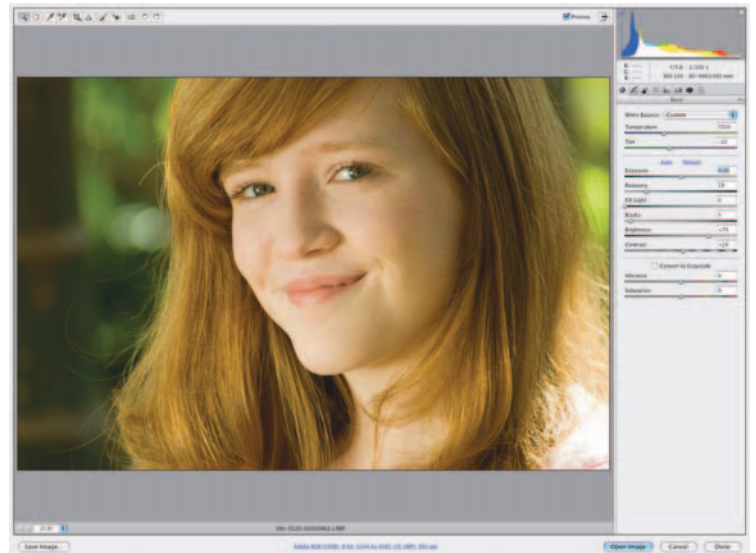
Above: As Shot

Below: Auto



Above: +20 Tint

Below: -20 Tint



Tonality

We have grouped together exposure, brightness, and contrast under the umbrella of “tonality.” If you missed the discussion of this, on pages 42 & 43, you’ll want to refer to that now.

Tone also considers recovery, fill light, and blacks, but we have moved them to the next two pages.

Exposure and Brightness?

Any imaging professional can make a stab at explaining the difference between contrast and brightness. We have been playing around with those controls on our televisions since childhood. Also, anyone with just a little photographic experience will tell you that exposure has something to do with the shutter speed and the f-stop (often skipping the sensitivity factor).

How many seasoned image-making professionals really know the difference between exposure and brightness?

Exposure focuses on the high values. The values are very much on the mark with a camera’s f-stops. It makes the same kind of incremental adjustments. Adjusting from +1.0 is like going from $f/8$ to $f/5.6$. Similarly, an adjustment of -1.0 is like going from $f/5.6$ to $f/4.0$.

The options on exposure prove a generous range of four f-stops in either direction. We rarely find this sort of adjustment to be realistic. If the image is that far off in exposure, it’s not usable by any of the standards that we know.

Exposure tends to clip the image in the highlights or shadows. Brightness compresses the highlights and expands the shadows, when you go on the high side.

You are better off starting with exposure, recovery, and blacks before you get into brightness. Use brightness with moderation, for best results.

Default and Auto

No matter how deep you dig yourself into the tonality adjustments, if you feel that you have created yourself into a quagmire, click on the default line.

Auto is a wonderful learning tool. Use it often when you are just getting started with ACR. Observe the effects carefully. Try making further adjustments that create an image more pleasing to you. Use it as an experimental point of departure.

Contrast

This slider is primarily directed toward midtones. It isn’t intended for shadows and highlights. The discerning Photoshop professional works with contrast after the exposure, blacks, and brightness values are set. 🌻



Correcting for Exposure brings out Peggy's rich, even tones.



Correcting for Brightness creates highlights.

Recovery, Fill Light, and Blacks

When Adobe announced these three new features to Creative Suite 3 in March, 2007, it was as if the magic of lighting had now joined the digital world.

Recovery

There's only so much you can do when your specular highlights are blown out. If they're gone, they're gone. If there's a little visual information hanging in there, you still stand a chance of reviving it.

Recovery makes a last ditch effort to recover details in the highlights. Adobe Camera Raw (ACR) tries to bring back some of these details where one or two color channels have been clipped to white.

Fill Light

We love this ACR feature. It's so magical. It too has its limitations.

Fill light can get you into more noise than the ears of your visual system can bear to hear.

In minor increments, it's a huge life raft that can give an image fresh direction.

It tries to recover the details in the shadow areas. Marvelously, it does not brighten blacks, keeping them rich and stable. ACR reconstructs some of these details.



Pumping up the Fill Light, from 0 to 35, removes some of the shadows, around Joi's eyes, but creates a very different image than the one to the right.

Blacks

Here's how you increase an image's richness. Using Blacks creates a sense of contrast. It primarily goes after the shadows, leaving the midtones and highlights intact. The result must be explored for a sense of the visual drama that may not have been practical to create on the set of the shoot. 🌸



Increasing the Blacks, from 4 to 15, drops out the background and gives Joi a bit of mystery, but it sacrifices some shadow detail.



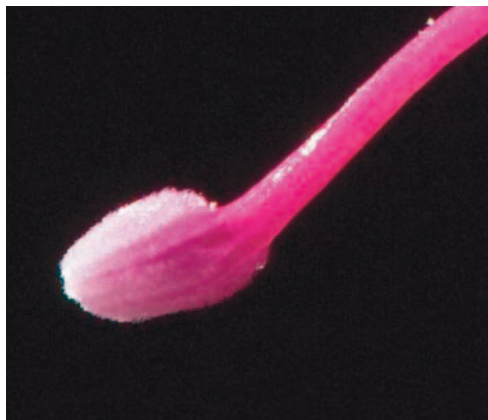
Clarity

Adobe Camera Raw's clarity is something akin to Photoshop's unsharp masking, a time-honored image-adjusting technique going back quite a few decades.

As much as we love to see images really pop, clients have cautioned us about its use. It can bring out a graininess. Once in place, there's no turning back.

Just as clarity can push the high side, it can have the opposite effect on noise reduction, though there may be better means of dealing with this.

Our thinking is that it's best to create the tif file in ACR and do all the rest of your Photoshop work. Once that's done, unsharp masking is your final step. 🌸



Running the Clarity up to the 100 maximum (left) does increase the image's sharpness. It also changes the color characteristics and brings out the grain.

Vibrance and Saturation

These are two very tempting features of Adobe Camera Raw.

Color Purity

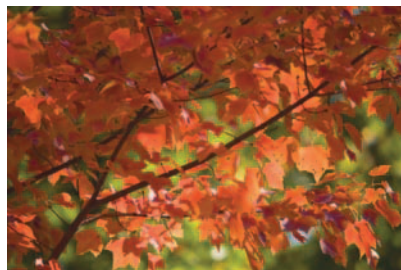
Vibrance and saturation brings out the pure hue of a color, a richness moving toward 100% of a color's cleanest characteristics. This is a very generalized adjustment for saturation. Please explore what you can do with the hue, saturation, and luminance tab to work with eight specific colors.

Vibrance

Image content is a huge factor in dealing with color purity. Vibrance is a dream come true to people photographers. It prevents skin tones from oversaturation. Clipping is minimized when colors approach full saturation. Vibrance works the less-saturated colors. The higher-saturated colors are not affected by adjusting vibrance.

Saturation

Quite different than vibrance, saturation makes adjustments to an entire photograph's colors equally. At -100 it's monochromatic. Saturation doubles at +100. 🌸



Cranking up the saturation to +46 makes the Fall foliage pop (above) compared to the image without any enhancement (left).

The Tone Curve

The tone curve is admittedly one of Adobe Camera Raw's most difficult toolsets to master. However, once you can call it your own, you have an amazing speed tool for adjusting the tone and contrast of an image in ways that are difficult to achieve by any other methods. So don't be shy in delving into this, if you want to be as professional as possible.

Complete your work in the Basics tab before selecting the Curves tab, which lies to the immediate right of Basics.

This is not completely like the Curves tool in Photoshop. The eyedroppers are missing.

Notice how this is two tools in one. There's a Parametric tab and a Point tab. Adobe has made this extra-easy to use.

What It Does

Just like on a histogram, the base of the graphic that you see represents the original tone values, with black on the left and the lighter values on the right. These are the input values. Running from top to bottom are the changed tone values, with black on the bottom and white at the top. These are the output values.

Parametric Tab

Get your feet wet with tone control by using the Parametric tab. Enlarge the image to

100% and use the hand tool to find a section of the image where there are noticeable highlights. Move the highlights slider to the far right. A few things happen on the screen. The image's highlights brighten, the colorful histogram on top reflects the changes, and the once-straight diagonal line that ran from the lower-left corner to the upper-right corner has sprouted another line that has bubbled up on the top.

Now try sliding highlights to the left, for the opposite response. Only the upper half of the line is affected.

Next, try the same with the shadows slider. Only the lower half of the line moves in either direction. Highlights and shadows keep the line anchored at the center.

Doing the same to the lights and darks gets the center point off its home base.

The highlights, lights, darks, and shadows are known as the region properties.

Split Controls

You're getting the hang of it. Dive in and play with the split controls at the base of the graph. Use these to limit or expand the areas of the curve affected by the region properties' adjustments. Darks and lights primarily affect the middle region of the curve. As you've

learned from your previous exploration, the highlight and shadow properties mostly affect the ends of the tonal range. Experiment with what happens as you move the pointers.

Point Tab

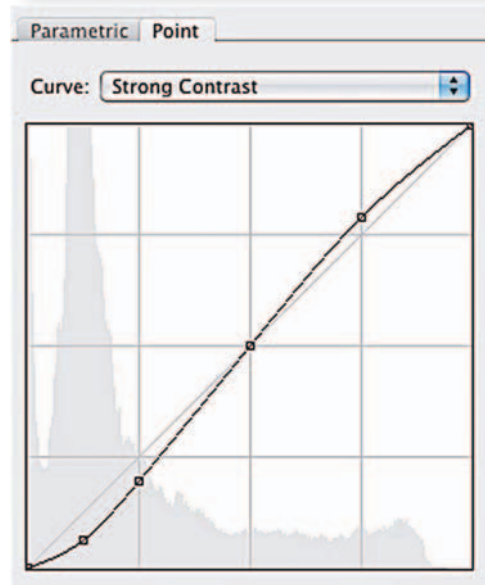
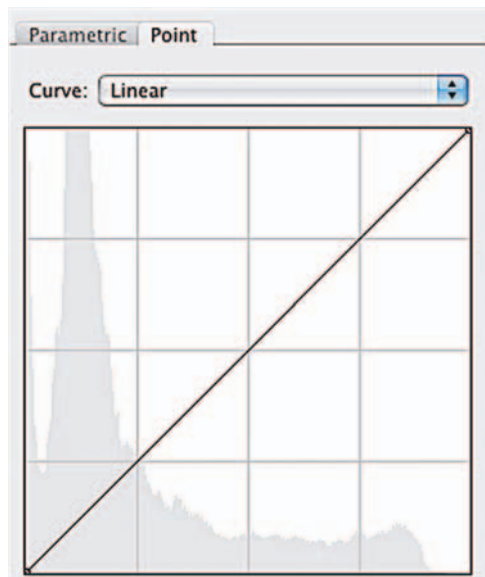
Switch to the Point tab and explore contrast. Return to the fit in window view.

There's a menu that gets you started on contrast. Medium contrast is the default. Look at what Linear does. Now go to strong contrast. As you've done this, the points on the line have been changing and so has the image's contrast.

Try dragging a point on the curve. Notice how the input and output tonal values change as you drag.

Add points by just clicking on the line. Get rid of a point by just dragging it off the graph.

When you move a point up, the output is lighter. The output darkens when you move it down. Moving a point along the 45° line makes no change. 🌸



Sharpening and Noise Reduction

Sharpening is a feature we skip in Adobe Camera Raw (ACR). We save that for Photoshop, if we sharpen the image at all.

Sharpening should be the last step in your image editing workflow. If what you're doing to the image stops with ACR, fine. Sharpen last. But ACR is rarely the last step. There's usually retouching to do and you don't want to try to retouch a sharpened image. It makes your retouching look uneven.

Types of Noise

Image noise can come from luminance. This is known as a "grayscale noise." It can put that film grain look in your digital image. It may show up in continuous tone spaces.

Chroma noise appears in an image's colored artifacts. These can be unattractive flecks of color that primarily appear in the shadow areas of your photos.

Both of them become more prominent during the sharpening process.

Noise Reduction

The best way to reduce noise is to not create any in the first place. Please see page 78 for more on this.

That said, please open a noisy image in ACR and zoom up to 100% or even to 200%. Use the hand tool to find a grainy area.

Under the Detail tab (the third one), reduce both luminance and color to zero.

If you have pumped up saturation or vibrance, you may have inadvertently encouraged noise.

These tools are great to use, but the more you put them to use, the more you soften the image. Utilize them lightly. Consider highlighting the number in the field and using your keyboard's up and down cursor keys to observe gradual changes. 🌸



Noise tends to build in shadow areas that have required adjustments in exposure. ACR's noise reduction capabilities can diminish that problem, with success dependent on each image.

Converting Color to Grayscale

Adobe Camera Raw (ACR) provides some powerful features for converting a color image into grayscale.

Go to the HSL/Grayscale tab (the fourth one in, that looks like a zig-zag) and check the Grayscale box.

Magically, your color image will be converted to black and white.

Now you're ready for the fun part.

With black and white films, you are able to place filters in front of the camera's lens to bump up tonal balance. By way of example, a red filter lightens red, orange, and yellow and darkens blue and green. This trick makes a blue sky with white clouds really pop.

ACR has given you a postproduction filter kit. The color combinations are different from those with black and white film.

Use the sliders to increase and decrease the reds, oranges, yellows, greens, aquas, blues, purples, and magentas. The incremental adjustments are far superior than any thing you could have done with filtering black and white film.

If you have played with them and have not come up with exactly what you're looking for, get yourself restarted by clicking on Auto or Default and start over.

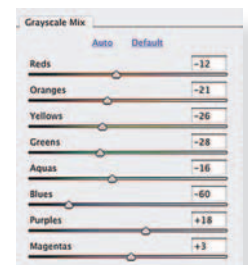
In the sample image, to the right, we rode the blue way down to get the deep sky. 🌸



Original Color Image



Black and White Auto Image



Hue, Saturation, and Luminance

Here are three powerful image enhancement tools that operate uniquely to Adobe Camera Raw. They are so powerful that you need to view your image at 100% to be sure that you are not causing problems. These may look perfectly fine when the image is in Fit in View mode. HSL (hue, saturation, and luminance) is sometimes referred to as LCH (lightness, chroma, and hue). It's all the same color model. *(You can read more about color models on pages 152 & 153.)*

Hue

Use the sliders to rock the reds, oranges, yellows, greens, aquas, blues, purples, and magentas in either direction. These dramatically alter the color of objects. A red tomato changes to a pale orange one when the red slider moves to the far right. With the slider to the far left, it becomes more magenta. These sliders are great for color correction.

Saturation

Though the tab changes, the slider set remains the same. However, the tools take on a dif-

ferent life under saturation than they do hue. Each slider allows you to pull the colors closer to their purest sense of the chroma as they slide to the right. They are toned down as they slide left.

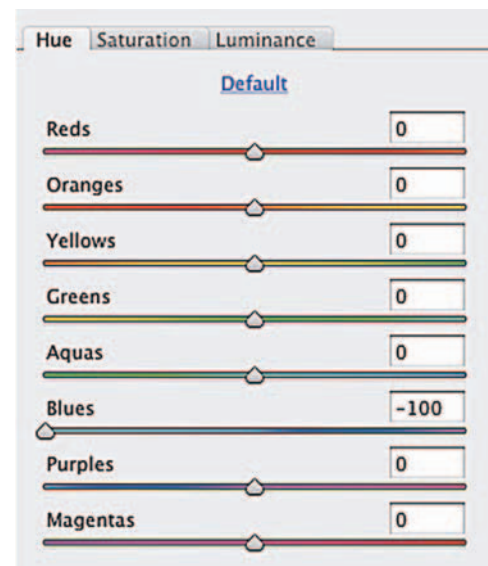
This is a great way to get a sky to go from a pale blue to a more vibrant one.

Watch carefully for any noise buildup, when increasing saturation.

Luminance

Everything looks brighter when you increase its luminance. If the colors on an illuminated sign do not appear as bright as they should, adjusting that one color could do the trick.

Keep in mind that unlike with Photoshop, these changes are not applied to selected portions of the image but to the entire image, so if you increase the luminance of a green sign, you also do the same to the green car that is parked in front of the building. 🌻



The above move of the blue hue slider was all that we needed to change Ellie's blouse to aqua, as seen in the upper right of the opposite page.



By simply sliding the blue hue control to the far left (as shown on the opposite page) we were able to change Ellie's blue blouse to aqua. Then, we changed it to purple to sliding the same control in the opposite direction. Needless to say, we lucked out in not having similar blues in the photo.

Split Toning: Highlights and Shadows

This is a cool tool! It lets you work on the saturation of a specific hue in just the highlights and another one in just the shadows.

This is another feature that needs to be operated at 100% to catch any noise buildup or other unwanted changes.

First, select the tab with the two boxes on the button.

Next, navigate in the preview window with the hand tool (“h” on the keyboard) to an area of the image where the color in the highlights or the shadows need a little punching up in its saturation.

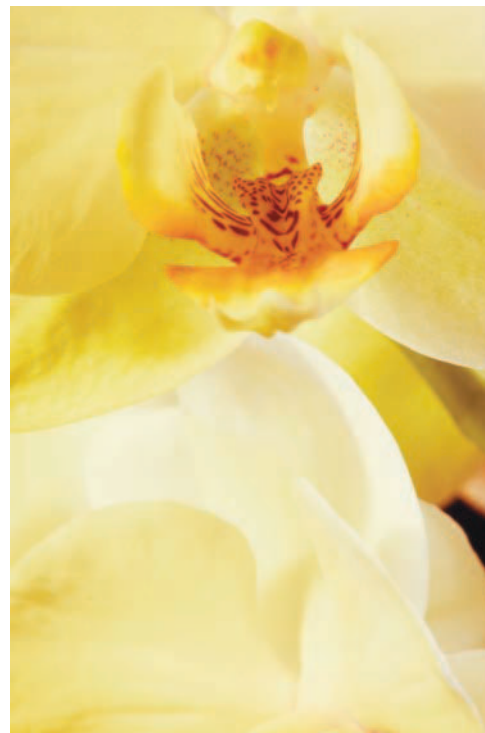
Choose the hue that you want to work with in highlights or shadows. As you move the hue slider, the color of the saturation slider will change to provide you with a closer representation of the saturation as you will be adjusting it.

Now rock your saturation slider in either direction until you get the effect you desire.

At this point, you have the option to go back to the hue slider and change it. It allows you to make minor incremental adjustments to the hue that you have already selected. Highlighting the numeric field and making tiny changes with the keyboard’s up and down arrows is a good way to go, too. 🌸



The original image (above) was enhanced only with the split toning slider for the saturation of the shadow areas (right).



Lens Correction and Camera Calibration

As discussed on pages 82 and 96 lens designers work to overcome the challenges of what optics naturally do to the light that passes through their lens elements. However, some-time realities bring out optical issues that are unavoidable. You can conquer these problems on an image-by-image basis.

Chromatic Aberration

Chromatic aberration is color fringing that may occur on a telephoto lens. When you very carefully examine an image, it is possible to discover some of this odd color contrast hiding at the edge of an object. We nearly never see these chromatic aberrations on our photographs. They tend to run from either red to cyan or blue to yellow.

Find the tab with the cutaway view of lens elements. You can choose to defringe the highlight edges or all edges. Zoom in tight as you observe the changes.

Vignette

We cover what this optical issue is about on page 96. However, we have never experienced one, on any of our photographs, so we joyfully have no examples to show you!

If we did have one, Adobe Camera Raw (ACR) could correct the darkened edges. If you are so unfortunate to have a wide-angle lens with this issue, once you adjust the amount of correction you require, you can then choose the midpoint for the correction.

Camera Calibration

ACR supports an amazing number of camera models. Just about as fast as new cameras come on the market, Adobe issues a new version of ACR.

For each of these cameras, ACR uses a profile for processing your raw images. We have never had a problem with this.

If ACR processes an image and the rendered color is not what you expected, go to the second to last tab button with the graphic of a camera. You can create your own calibration and save it.

All ACR tabs allow you to save settings and load them. To the far right of the bar, with the tab's name, is an arrow. Click and hold on it and a menu drops down. Choose to save your settings and the next time you need them, use the same menu to load your settings. 🌀



The blue fringing, seen on the doctor's shoulder and stethoscope, can easily be repaired with Adobe Camera Raw's Chromatic Aberration tools.

Film to Digital: Pro Scanning

Unless you are a complete newbie to photography, you have a library of great images, shot on film, that need to become part of your ever growing digital asset library. Just as you edited the raw files, from your digital camera, with Adobe Camera Raw (ACR), you can take similar exceptional control of



the negatives and transparencies in your film collection, migrating them to your permanent digital library.

Drum Scanners

As mentioned elsewhere in this chapter, film scanning was once the exclusive territory of the drum scanner, a device that could easily climb into the six-figure cost range.

We used to own one.

It was great for 4" x 5" and 8" x 10" sheet film. We'd tape the film to a glass cylinder known as a drum, and place it inside the big metal box, closing the lid, while the scanner spun the drum up to speed and a PhotoMultiplier Tube ran along the drum, reading the film from one side while it was lit from the other. We'd need to pop 35mm slides out of their holders and tape them in place as well.

If your studio couldn't afford one of these monsters, you'd have to send your images out somewhere that could scan the images and get them back to you, later in the day or later in the week, depending on their workload.

With time, desktop scanner technology improved to the point that what we were doing with the once-loved beast could be done with far better results on something smaller than some of our camera bags.

Film Scanners

Drum scanners have not completely gone the way of the dinosaur. There are still many in operation. However, the price of some of the best film scanners out there is far less than what it costs for someone to scan a small fraction of their library.

As you learned in the ACR sections of this chapter, so many postproduction choices are very subjective. The images are your photographs: you want to be the one making the judgment calls, before the scan begins, rather than trying to adjust someone else's scan decisions in Photoshop.

Much like how ACR has all the power while the image is still in the raw state and there is less room to maneuver once it's a tif, the same is true after the scanner creates the tif. During the scan setup, is when the decision-making process is the most open.

What Is a Scanner?

A scanner is pretty much a camera trapped inside a box. It has most of the elements of a digital single lens reflex (dSLR) camera. There's a sensor. It needs a lens. The scanner has its own built-in light source. It's just that instead of going to the images, the images come to it.

CCD: Charge-Coupled Device

Just like the sensor is a digital camera's retina, the same is true of a scanner. It requires an advanced sensor system. Instead of the Photo-Multiplier Tube (PMT) in a drum scanner, or the Complementary Metal Oxide Semiconductor (CMOS) in a camera, many desktop film scanners use a Charge-Coupled Device (CCD) as its sensor. The CCD works a bit differently than a CMOS, but the principles are similar.

The CCD in a scanner is highly advanced. Less-refined CCDs are used on inexpensive digital cameras.

Resolution

A scanner can actually have a greater resolution than some of the finest dSLRs out there. A Nikon D3 captures 4,256 x 2,832 pixels. A Nikon Super Coolscan 9000 ED, when scanning a 36 x 24mm photo, grabs 5,413 x 3,608 pixels, around 27% more than the camera.

This is not to say that the scanner has the dSLR beat. The direct line from the camera's lens to the sensor creates a sharper image than when the scanner has to rely upon the middle-man, the film. Something gets lost in translation.

A good scanner needs a resolution of 4,000 pixels per inch (ppi).

Some scanner specs claim to have 4,000 ppi, but that's actually "interpolated" resolution and not the real thing. The built-in optical resolution is what you depend on for a pure scan before it's tampered with.

If the optical resolution is 1,000 ppi, some scanners will interpolate the image to 2,000 or 4,000 ppi. The interpolated image may look sharper because of how it was altered, but when you go to work with it, the sharpened photo can be problematic.

Please continue to read further for more on what interpolation is all about.

Glass

Without a terrific lens, a scanner is lost. The lenses for scanners have all the design challenges of those that go on a camera.

A scanner lens with spherical aberration issues cannot capture a great image. The optics of a scanner need to be as flawless as possible.

Color Depth Plus Dynamic Range

One of the things that makes judging a scanner very different from a camera is its dynamic range. It goes hand-in-hand with the color

depth, which we discussed on page 155. On a scanner, the color depth measures the number of colors it produces in the digital image. The analog-to-digital converter that a film scanner uses to take the light that the CCD receives and changes it into digital form determines the number of brightness levels it can produce.

An 8x8-bit scanner produces 256 colors per pixel. It actually has 8 bits of color per channel. Scanners are creatures of an RGB world. Each of the three colors represents a channel. The scanner produces 256 shades of red, 256 of green, and 256 of blue. The math looks like $256 \times 256 \times 256 = 16.7$ million distinct colors. That's similar to human color perception at its best, too.

This 8 bits per channel equals 24 total bits.

Scanner specifications for dynamic range are sometimes called "optical bit depth" or "tonal range." It's the range of light from darkest to lightest that's possible for a scanner to read. A large dynamic range produces more shadow and highlight detail. To obtain a great dynamic range, it's essential to preserve detail in highlights and shadows, just like when a great photo is created. When a scanner has a high bit depth, but a low dynamic range, the shadow and highlight areas are poor. If there's



a great photo with a great dynamic range on film, only a great scanner can do it justice.

Flat-Bed Scanners for Film?

A flat-bed scanner is intended to read the reflected art of opaque materials. They

sometimes come with accessories for film. It helps the user capture something (anything), in a pinch, but when compared to what a film scanner does, they just don't hold a match to the real deal. As with the drum scanner, great light is needed on one side while the transparency is read from the other.

Evaluating the Scan

Now that you've made a scan how do you determine whether you did a great job? Make yourself a checklist like the following one. This is just your point of departure. What makes a great image is much like what constitutes a great dinner: everyone's personal tastes vary.

- Is the image sharp? When you look through the loupe, do you see as much clarity as appears on your calibrated display?
- Do the colors have the same vibrance and saturation as the original?
- How faithfully have the colors been captured? Some films have their own personality which is difficult to reproduce in a scan, but are the scanned greens close to the greens in the original film?
- If the film's characteristic is its graininess, has the grain been preserved?
- Have the film's imperfections been eliminated? Does it still have scratches and other unwanted artifacts or dust?
- Are all of the details present in the highlights and shadows, or are some of the highlights washed out? Do the film's smallest shadow details appear on the scan or have they blocked up?

☛ Did the scan actually improve upon the image? Were there previous issues with brightness, contrast, or saturation? Have they been resolved? Did you scan this with new color directions in mind? If so, have those goals been attained?

Interpolation

Those of us who have been involved with image processing for many years may be under the false impression that we have invented yet another regularly used term, “interpolation.”

Nothing could be further from the truth.

When we have two known points of data and we insert something between them, we are making an estimate as to what’s supposed to be in the middle. That’s interpolation.

The same happens when we upsample or downsample an image. *(Please see pages 160 & 161 for more on this.)* Assumptions must be made to arrive at the image size we need. Pixels must be either deleted or filled in. When you resample, changes occur to the image. In upsampling, you create blank pixels and the process needs to fill in the blanks. To downsample, some pixels are tossed in the trash and the remaining pixels must be altered to make up the difference.

The End Use

This is the way of the scanning world. Do you re-scan every image to meet a specific usage or do you scan as big as possible and go with what you have, once downsampled or upsampled?

In Chapter 4, “Light, Color, and Use,” we focused upon how the end use determines everything. The same could be said of scanning. If you are scanning for a web site, it’s a different story than scanning for a two-page spread in a finely printed publication. One is a 72 ppi image and the other demands 300 ppi. The former could be just 1" wide, whereas the latter might require better than seventeen times that.

Scanning for a digital library comes with practical considerations.

For our needs, like those of many stock imagery houses and their clients, we choose to library the image to the maximum possible scan and resample as needed.

The previously mentioned 5,413 x 3,608 ppi image from the Nikon Super Coolscan 9000 ED, at a resolution of 300 ppi, equals a little over 18" x 12", for quality print publication. If printed on an ink jet, at 150 ppi, that would be a 3' x 2' exhibit piece.

That’s not bad! 🌸

Pictured to the left is the Nikon Super Coolscan 9000 ED able to scan from 16mm to medium format film. It has Digital ICE capabilities embedded in its hardware for image clean-up.

Scanning Tools

If the scanner is the body, it can't do anything without a brain. The software is the scanner's cerebral headquarters.

When buying a scanner, don't make a decision based solely on the hardware. There are plenty of great scanning devices available that

come with software suitable for those who put together personal scrapbooks.

Accept nothing less than the kind of software tools that make drum scanner operators feel at home. You are manipulating some great photographs and they deserve world-class tools if they are to realize their fullest potential in a competitive marketplace.

Film Holders in the Workflow

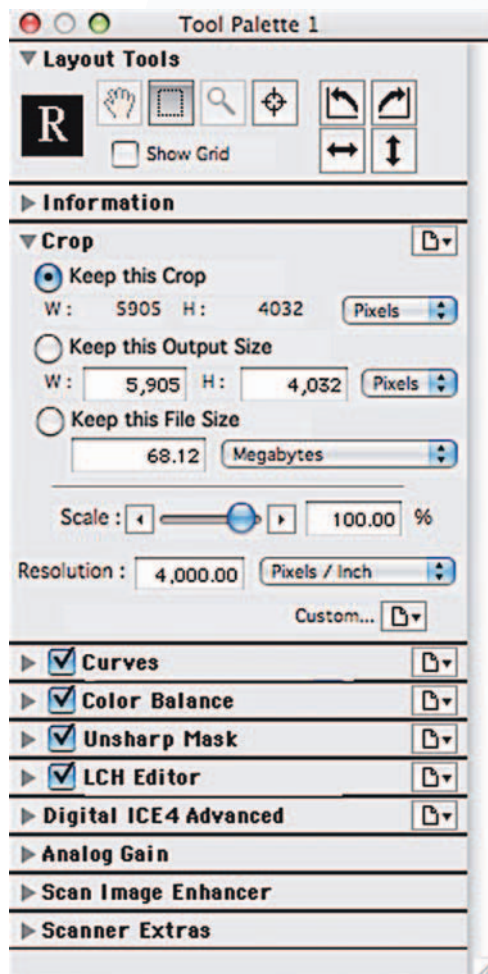
From the day that you unpack your new scanner, vow that you are going to keep the film holders as pristine as possible. Just as dust is an enemy of film, dusty holders merely exacerbate the problem. Many professional scan operators work in an environment that resembles a clean room.

Follow this kind of scanning workflow:

- Dust off the scanner and the whole workstation's area.

To the left is the Scan Window of Nikon Scan 4, with the thumbnail drawer open to 5 previewed slides. On the right is the Nikon Scan Tool Palette.





➤ Get the holder out of a convenient drawer. Remove it from a protective bag.

- Blow off the holder with a dust remover.
- Blow off the film. Insert it in the holder.
- Blow off the film in the holder.
- Complete your scanning.
- Return the film to its page and return the page to its drawer, right away.
- Put the holder back in its bag right away and return it to its drawer.

Emulsion Side Down

We get so used to digital images that we can forget film's properties.

Film has two distinctive sides. The shiny side is the base of the film stock. The side with

the matte finish is the emulsion. Hold it up to a bright light. Tilt the film at an angle. The emulsion side appears to have a few very thin layers stacked up on it in relief.

The film has to go into the holder with the emulsion side down, just like in the days of enlargers in the darkroom.

Your scanner may be so powerful that it will make some semblance of a good scan if you insert the film in the wrong way, but some of the software tools will be disabled.

Go with What You Know

Our scanning software discussion is based on the Nikon Scan application that comes bundled with their Coolscan devices. If you have another scanner brand, some of the tools may be similar. If your scanner is software-

poor, there may be some powerful third-party software applications that are compatible with your computer and scanner. (Maybe it's time to evaluate whether your old scanner is up to the task of building a professional-quality image library and whether a new one is needed.)

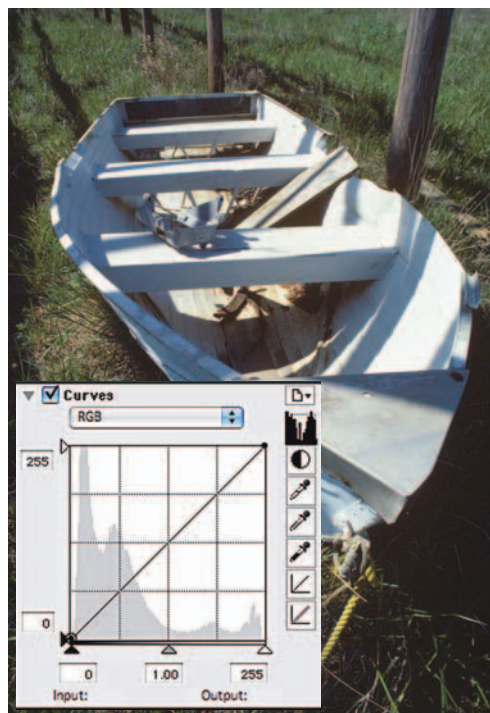
Curves in All the Right Places

Across the bottom are four examples of how a scan is improved with curves.

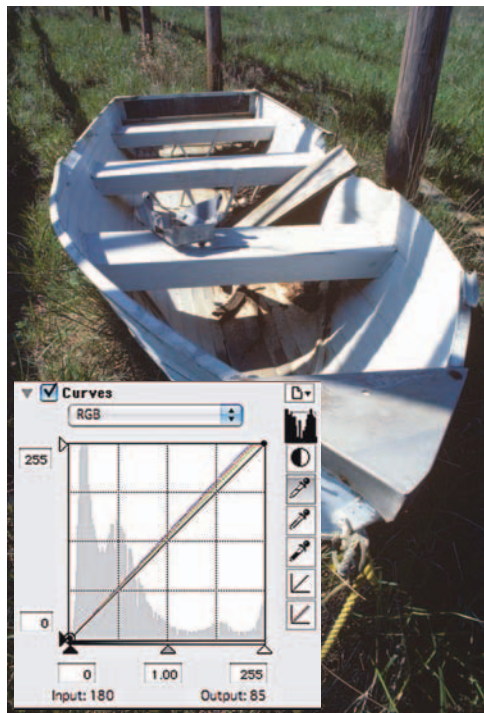
On page 216 of this chapter, we explored the tone curve of Adobe Camera Raw. How it works for your scanning software is pretty

similar. Nikon Scan has a few tools to make it very simple to get the tone curve started.

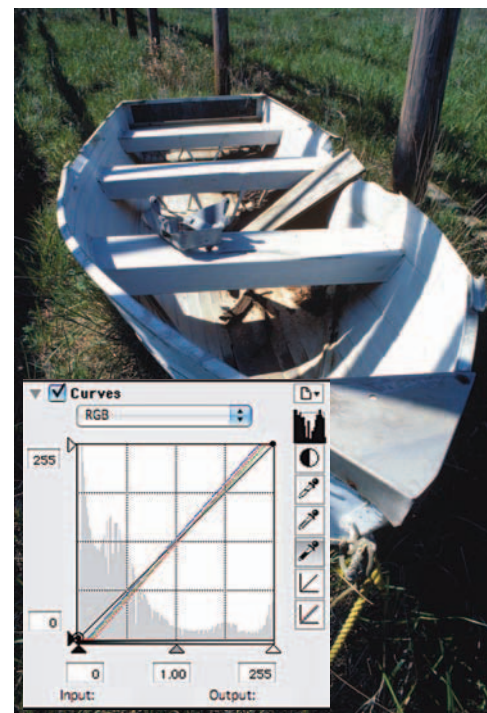
There are three eyedroppers on the Tools palette, under the Curves drop-down. Once you have a great preview on your screen, make it better. Find the image's white point and



Raw scan

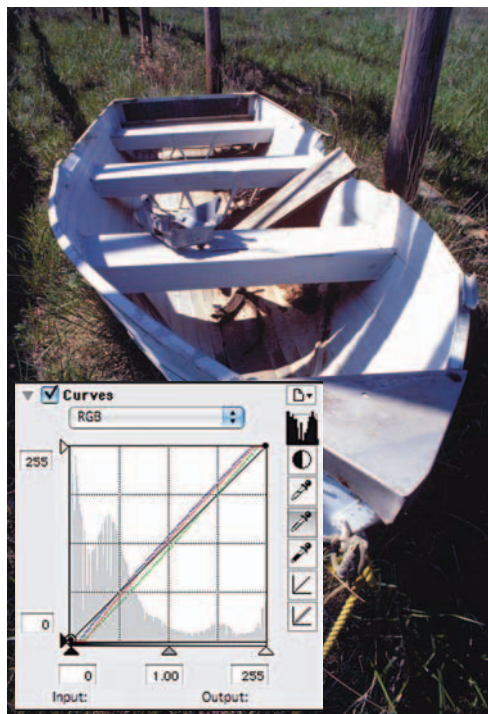


With white eyedropper



With black eyedropper

click on it with the white point dropper. Notice how the curve has picked up three new lines, one each, for the RGB channels. Now do the same for the black point of the image. Next, find the gray point. With each dropper, you should see your image evolve.



With gray eyedropper

If you get yourself in a bind, the two buttons under the eyedroppers allow you to reset and start over. The first one is for the curve you are working on now. The other button resets all curves.

Use the histogram button to see the changes that you've made.

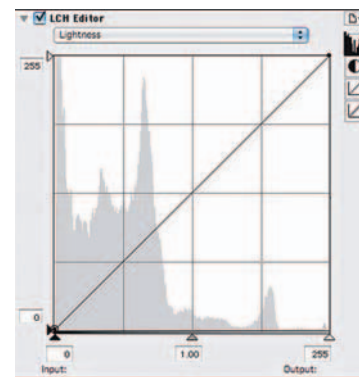
Lightness, Chroma, and Hue Editor (LCH)

On pages 220 & 221 we discussed how hue, saturation, and luminance (HSL) sometimes goes by various aliases: lightness, chroma, and hue is one of its other names. It's HSL traveling as LCH. "Luminance" to Adobe is "lightness" to Nikon, just as "saturation" is called "chroma," in this application. (You can read more about color models on pages 152 & 153.)

The lightness and chroma part of the palette is very similar to the Curves palette in terms of how the buttons work. The black point, white point, and center gamma sliders at the base of the graph work just like they do with Adobe Camera Raw's curves, as we discussed on pages 216 & 217.

How hue works on this palette is unique. It's controlled by the horizontal line that runs through the center of the colorful graphic. The hue of the image is adjusted by moving

a point from that line around the field. A slider at the base of the graphic widens the range of the affected area.



LCH Editor

Digital ICE

No matter how carefully we have handled some film assets over the years, there are always the favorite ones that have been in and out of the darkroom and off to the prepress house or that service bureau so many times that they've begun to take on the characteristics of a well-loved teddy bear. No matter how much canned air we hit them with, they do not completely clean up.

The image of the ironwork on a home, featured on the next page, is a good example. It's seen some usage.



The top photograph, of the home is seen in the three examples under it, in greater magnification. Directly above is the raw scan. In the upper right, Digital ICE, normal, was applied. Under it, fine dust and dirt reduction was used. This happens automatically in the post scanning process.



On close examination, at this size it looks fine. However, to the left, observe the three examples of the results of the raw scan, “ICE” applied at normal, and then ICE fine.

Digital ICE can rectify that issue, once and for all. “ICE” is an acronym for Image Correction & Enhancement. It came from the software developer, Applied Science Fiction, now Kodak’s Austin Development Center.

Besides ICE, there’s ROC, GEM, and, DEE. Though tightly integrated in the scanner’s design these are primarily for postprocessing, meaning that the image is scanned



The top photo has no Digital Grain Equalization & Management (GEM) applied. The one below it has GEM at the full level 4. There is less grain, but the price is a slightly softer image.



and then the software goes to work doing the cleanup. ICE is a scanner function.

The centerpiece of ICE removes dust and scratches on images. Needless to say, this can be done by hand in Photoshop. We have

found ICE to be an excellent solution that is just as capable as our own hands, and of course far faster. It can be set to a normal mode or a fine one. We usually run both, and then make an evaluation.

Digital ROC (Restoration Of Color) works magic on faded color films. It's not something we need, these days, but when we had a store-front studio, it would have been a big seller.

Digital GEM (Grain Equalization & Management) deals with reducing the effects of film grain, by reducing film grain patterns on a scale of zero to four. This can be of some assistance in repurposing a photograph that had been shot on one of those fast films with pronounced grain structure that may have been acceptable back in the day, but is not considered quite as welcome today.

Digital DEE (Dynamic Exposure Extender) pulls out hidden details in highlights and shadows, sort of like Adobe Camera Raw does with its Recovery and Fill Light tools.

Scan Image Enhancer

The Scan Image Enhancer is a one-click solution to photos that need a little kick. It takes dull images and automatically brightens them and punches up color saturation. Optimized contrast adds life to an image and becomes a

far better starting point for work in Photoshop, the next step.

Multi-Sample Scanning

Just as the CMOS sensor in your dSLR camera can encounter noise, unfortunately the CCD sensor in your scanner can do the same. Multi-sample scanning helps overcome this issue. The more often the image is scanned, the greater the opportunity of reducing noise to the point that it is virtually eliminated. Make as many as 16 passes in increments of 1, 2, 4, 8, or 16.

This isn't a speedy process. The scanning can take a while.

Unsharp Masking

Some of these features can cause the image to gain a little softness. None of it is to a detrimental level. Nikon Scan has an unsharp masking feature that can repair this for you.

We cannot recommend sharpening your image, at this point, unless, for some reason, you need to complete the scan, without going to Photoshop, as the next step.

Usually, we need a little more retouching or image enhancement before we feel that we have perfected the photograph, to its maximum possible quality. We recommend sharpening as your last step. 🌟



Ambient Light

After 235 pages, you know enough, by now. Let's get out, in the field, and do some photography. This chapter is geared toward putting into practice what we have discussed, so far.

Exploring how to harness ambient light is the precursor to learning how to take what happens with light naturally and apply it to artificial illumination. Once you understand ambient light, what you do with flash and continuous light sources will look more natural.

For the most part, there isn't much you can do to dramatically change our natural light source; it's a matter of making the most of what you've been given.

So much of working with existing conditions is the joyful synergy that comes from the creative mind, your mastery of the technology, and the sheer pleasure you find in the beauty that is all around you.

Whether it is a day of warm, glorious sunlight or a wickedly chilly winter's evening, it's your job to find the visual dynamic in it all. Once you've found it, exploit the situation to the fullest, so the viewer wants to climb into the moment and experience it just as you did.

The challenge of the perfect ambient light is that it's on a clock. It won't last long, so you can either capture it now, or you can capture it now.

Make it your goal to flex your visual muscles every day, to the point that you become an imaging sponge in motion, constantly soaking in all that's around you everywhere you go. 🌸

Early Morning

It's our nature to control the photographic environment. We plan everything.

To love nature, you just have to get out there and embrace it. Morning light is like that. Photography in the early morning hours is something of an adrenaline rush. So many great image-making opportunities are right there, in front of your face, and you know that the chance to photograph them isn't getting down to the minute; it's more like the second.

It is not as if you can wake up, look out, and see the moment, know the perfect spot, and then drive there. By the time you arrive, it's too late.

You're not completely at the mercy of the elements. Some of it can be anticipated with a degree of certainty. Tune your eyes and ears to the weather. Conditions are somewhat predictable within as much as a 72 hour window of opportunity.

If you see conditions this morning that you absolutely love, note the temperature, humidity, dew point, cloud cover, wind movement, and direction. Are the same conditions forecast for tomorrow?

What causes fog or dew or frost to form?

Get your own weather station. There are some great ones available, for a minor investment. They record conditions to your computer 24/7/365 and keep a running log with

years of weather history noted in it. They also provide forecasts and weather alerts. Davis Instruments has some great systems.

If you're an image-maker who enjoys fascinating technology and nature, you'll love having your own weather station.

There's probably a weather station owned by someone else not far from your home. It can report conditions directly to your computer in real time. Look into the WeatherBug network's free desktop weather application.

If you really get into weather, there's some expert training available to you. We're trained weather spotters for the National Weather Service. We provide "ground truth" weather reporting for potentially dangerous weather. Meteorologists train us in what to look for and how to report it. From that training, we have sharper weather eyes.

The photograph, to the right, was captured at 7:29 a.m. on January 6. We had similar conditions the day before. There was sufficient humidity and no air movement. Fog was forming when we went to bed and the skies were clear. Checking the weather radar and satellite tracking online and with television weather reporting, we had a good chance of finding the same conditions as the day before.

Just as we cannot fully control the magic of nature, we also need to just shoot the images

Tech Specs

Photographer

Brian Stoppee

Camera

Nikon D2x - ISO: 100 • Shutter Speed: 1/80
Programmed Auto

Lens

AF Zoom-Nikkor 80-400mm f/4.5-5.6D ED @ 122mm
35mm Focal Length: 183mm @ f/4.8

Support

1 - Gitzo Mountaineer
1 - Gitzo Off Center Ball Head

Software

Adobe Bridge, Camera Raw, and Photoshop

and trust the camera to know what's best. In conditions like these, that's not too much of a leap of faith. We are primarily dealing with pastels here. There's neither a specular highlight nor a deep shadow to be found anywhere in the photograph. The image is a study in neutral densities.

We are in awe of the photographers who stage huge shoots with an eye to the sky, gathering talent and crew at a remote location, expecting to find the light and climate exactly as they need it when they get there. It's all a matter of experience and planning. ☼



Midday = Diffusion

Harsh, natural illumination is a challenge. Your only response is to manage it as best you can. Options include attempting to manipulate the light with modification tools, attempting to overcome the situation with some industrial-strength artificial light to act as a fill light, or simply run for cover.

Some days the most noble response is the latter. Work with what you have. Bring your subjects into natural shade.

In the image to the right, we captured our happy crew of runners at 11:39 a.m. on the second day of a warm September. The photo works as they enter the diffused illumination of the trees. Though this places one of the background models in shadow and the other with specular highlights on his face, our attention is drawn to the two runners in the foreground. They're in shade and their faces and body language tell the story of their joy.

Midday light is hard. It's directly overhead, casting shadows into the sockets of the eyes. To make matters worse, some of the contours and surfaces of the face become drenched in hot spots. The range of light from the specular highlight to the deepest shadow goes beyond what most media can hold with details in those two areas.

This photo was made on a gorgeous, working wooden bridge that has a curve to it.

The bridge spans a historic canal. Our talent director perched herself on the railing that's on the opposite side of the bridge. She'd cue the talent who would start a few yards back so they could get up to speed and honestly live the moment.

We planned the shoot so that they would enter our frames at just the right place. We'd squeeze off more than one frame per second, from two separate and distinct vantage points. This shot required more than a dozen takes as a group shot. To get ready for it, we shot each model doing the same run separately. This gave them the chance to make a wardrobe change for the group shot.

As previously mentioned, the shot could have been done differently. We could have brought in a great deal of fill light. Flash heads and monolights, in umbrellas or light banks, could have accomplished the same. We had plenty of Novatron, Chimera, and Westcott gear with us set up a couple miles away. However, there was not an AC outlet around for over a mile.

We did pack eight Nikon Speedlights, which could have provided a very simple through-the-lens solution. To go the battery flash route, we would have wanted to do further testing. With only four models, on a full day of shooting, we chose to make the best of

Tech Specs

Photographer

Brian Stoppee

Talent Director

Sherrie Hagan

Camera

Nikon D2x - ISO: 100 • Shutter Speed: 1/500
Aperture Priority

Lens

AF-S VR Zoom-Nikkor 70-200mm f/2.8G IF-ED @ 200mm
35mm Focal Length: 300mm @ f/3.2

Light Meter

Gossen Starlite

Support

1 - Gitzo Mountaineer
1 - Gitzo Off Center Ball Head

Software

Adobe Bridge, Camera Raw, and Photoshop

Talent

Geoff Salgado
Jill Robinson
Domenic Scotty
George Hambleton

the ambient light and be sure everyone got a lunch break before the afternoon's shooting.

Because capturing as much frozen action as possible was key, we opened our lenses wide and shot in aperture priority mode. 🌸



Gender-Specific Light

Some light works for a man, but just looks all wrong on a woman or a child.

Light says something about a person. There are psychological relationships between light and camera angle that are embedded somewhere in the back of our heads.

Sidelight can be very masculine. In some situations, it can be so hard that other resources need to be introduced to modify it.

In the photo to the right, we placed Fred adjacent to a granite wall. The light not only illuminates him to the left, but it strikes the stone and reflects back, filling in the shadows on the left side of his face.

Without the reflection, the shadow detail would be lost. Using the reflection to our advantage, the hard light is transformed into an image that looks like this gentleman is a force to be dealt with.

We have given Fred even more of a power position by shooting him below eye level. We look up at him. He looks down on us. It places the audience in a child-to-parent relationship with the subject.

The shadows give the man a sense of mystery. There are some details to the right of him that are not completely clear. It leaves the viewer with a subliminal sense that there must

be something else about him that we don't know, as well.

This is also a great light for a young male, especially if he has softer facial features. It allows young athletes to look a little tougher than they may be.

Women photograph with flattery in a diffused illumination.

On the next page, Charlsey, in shade, has soft highlights on her face. Shadow detail is quite clear, all over the subject. The photograph is soft, gentle, and inviting.

Our camera angle is slightly above her eyes. As pretty as she may be, Charlsey appears very approachable. By contrast, Fred looks like someone we need to prepare ourselves to confront. Actually a very affable model, Fred photographs well in diffused illumination, too. It's just a very different look that makes a very different visual statement.

Female professionals photograph well from power-position camera angles. With the proper expression, it can even work for a trusted day care provider or nurse.

Hard light on a woman says something, but it's not always a very feminine commentary on their personality. When dealing with sidelight, another response is to place a dif-

Tech Specs

Photographer

Janet Stoppee

Stylist

Tracey Lee

Camera

Nikon D2x - ISO: 100 • Shutter Speed: 1/180
Manual Mode

Lens

AF-S VR Zoom-Nikkor 70-200mm f/2.8G IF-ED @ 120mm
35mm Focal Length: 180mm @ f/6.7

Light Meter

Gossen Starlite

Support

1 - Gitzo Explorer
1 - Gitzo Off Center Ball Head

Software

Adobe Bridge, Camera Raw, and Photoshop

Talent

Fred Iocova

fusion material between the subject and the light source, use reflection material, or add flash as a fill light source. All of these methods soften the light's characteristics. 🌸



Late Afternoon

The end of a great workday has many photographic rewards. A beautiful warm light is beginning to develop. With a little cloud cover or in a shaded area, light's dynamic range narrows. The details in highlights and shadows are superbly retained.

Photographing the always stunning Charley was right, at a perfect 5,500 K, with a 35mm film equivalent focal length of 300mm at $f/2.8$.

Though the swing is only moving, very gently, we pushed our luck with a shutter speed that the camera chose: 1/160 of a second. We did a bit of quick testing to be sure that we were comfortable with that.

Because it was 4:26 p.m., we choose to open the lens as wide as possible and set the camera to aperture priority, just making the best of the situation. We felt it was best to allow the camera to make any minor adaptations to the changing light. Our only choice was to shoot wide open and it seemed better than risking higher sensitivity noise.

With a little testing, while Charley's makeup and wardrobe were being refreshed, results looked good, so it was not as if we were flying blind. For a shoot like this, we needed to make responsible decisions.

Fifteen minutes later, things would have been very different. The window of opportu-

nity is very small with the late afternoon light, in shade.

At a time of year other than August, or at a far more northern location, this would not have worked as well.

When shooting outdoors, there's a need to not only hold the light in and around the talent, but to balance it with the light in the rest of the scene. Here, the light on our model is only a half stop brighter than what's on the background, but it's enough to pop her out from the greenery that is many yards away behind her. The goal is to separate the action from what backs it up, but make the difference unnoticeable.

The color choices work for us. Charley's flesh tones and the magenta of the dress compliment the greens that surround her.

We naturally sense the motion of the swing coming toward us. The dress's color and the similar hue of the flora in the background makes it feel as if the two magentas are coming together.

The rope of the swing complements the soft highlights on the model's face at similar values. The colors and tones are in concert.

Just on the other side of the swing's tree is about 8,000 watt-seconds of flash power. We chose not to go that direction, as the scene is very motion-oriented. It was getting late and

Tech Specs

Photographer

Brian Stoppee

Camera

Nikon D2x - ISO: 100 • Shutter Speed: 1/160
Aperture Priority

Lens

AF-S VR Zoom-Nikkor 70-200mm $f/2.8$ IF-ED @ 200mm
35mm Focal Length: 300mm @ $f/2.8$

Support

1 - Gitzo Mountaineer
1 - Gitzo Off Center Ball Head

Software

Adobe Bridge, Camera Raw, and Photoshop

Talent

Charley Kauffman

to maintain an even light balance would have required that we halt everything and re-measure light every few minutes to maintain an evenness between the artificial light and the natural illumination. That would have risked losing the mood, which was casual, relaxed, and joyful.

Striking just the right mood with your talent is essential to getting great results.

There's a bond of trust. If you have the chemistry, it's seen in your work. 🌸



Silhouettes and Sunsets

Some of our first photographic instructions are to shoot with the light behind us, followed by “never shoot into the sun.” When the sun is setting, those photo axioms go out the window, but with words of caution.

Looking directly into the sun can cause eye damage. It can not only damage the retina of your eye, but can do the same to the sensor inside your digital camera.

Also, the sun can fool your camera’s meter.

For sunsets, think of the sky as a big gray card. Find the part of the sky that appears 18% neutral and take a spot reading.

Photographing the sky as the sun sets is a dynamic situation, just as it is when the sun rises. The conditions change by the minute. The meter reading that you got 90 seconds ago might not work any more.

You are guaranteed, beyond the shadow of a doubt, that every evening the sun will set. How the setting sun will render the sky is anyone’s good guess.

The sunset encourages us to increase the drama through object color. The gardens of Claude Monet were planted in warm colors to offset the sky’s color at the end of day.

In the sun’s final moments of the day, it’s a great time for objects to go colorless.

Capture silhouettes.

Objects become backlit. Their details on the ground are lost in darkness, compared to the illumination of the sky.

This creates fascinating cookie-cutter objects. The specifics of these things are left to our imaginations. What we can’t see, our minds create for us.

In the image to the right, we know there are utility poles. The highlights of the metal rails tell us that railroad tracks are in the foreground, so our minds tell us that the poles line the tracks. However, we have no information about the buildings that are beside the tracks. All we see is the form that their outline provides. One person sees their shape and conjures up a sense that they must be something quaint and attractive. To someone else, they are industrial and not a revered element.

The leafless trees make it obvious that it’s winter. After carefully observing the photo, the viewer can see that there is snow between the rails, creating a color contrast between the red-orange sky’s intense warmth and the cool blue on the snow. We enjoy the comfort of the warm sky, but realize that as the sun sets, there’s a reality of the cold that lies ahead here on earth. Without a soul in sight, the mind may see the hours ahead as lonely, maybe even frightening.

Tech Specs

Photographer

Brian Stoppee

Camera

Nikon N90s

Lens

AF Zoom-Nikkor 35-70mm f/2.8 @ 35mm

Scanner

Nikon Super CoolScan 9000 ED

Software

Adobe Bridge and Photoshop

Nikon Scan 4

At this point in the day, there isn’t much that can be done with people photography that looks naturally illuminated. However, a few minutes before this was photographed, people in silhouette could have provided some fun visuals. Young people could have been playfully using the rails as balance beams. Reflector materials could have tossed a little light back in their direction. Never encourage anyone to play on the tracks. Get permission before you use any property and be advised of safe use times. 🌻



Candles and Firelight

Fire epitomizes passion.

Whether you're photographing just a candle or adding people to the image that contains an illuminating fire, it says warmth.

As dim as a candle's light may be, with the sensitivity of your camera cranked way up and a longer shutter speed, it's possible to have enough light to illuminate a subject. Of course, when the subject is a person, they need to remain still if you are to get a sharp rendition of them.

You can take a photograph with only the light of a match. This is when it pays to have a fast lens with a maximum aperture of something like $f/1.4$. Keep in mind that longer digital exposures create noise as do higher sensitivities.

Light source to subject distance applies with all light sources, as we discussed back on pages 136 & 137, even matches. If you want the clever image of someone holding a match up to their face, while the rest of the space is black, there's a space between the match and the subject that provides enough illumination to see a fair amount of the face and is still at a safe distance from the model's skin.

When working with even tiny amounts of fire, safety is a consideration.

The size and intensity of the fire is a key element in whether you achieve the image that's living in your mind. When the light source is a roaring fire, you do not have a great deal of control of the light's intensity.

If your goal is for the light to create a fair amount of illumination, the flames may need to go to white.

In the photo to the right, it's unmistakable that two flames are burning, even though we cannot distinctly see the candles or the flames.

It was the only significant light source. There is enough light to create pretty reflections on the wine glass. Just the presence of the flames and the suggestion of stemware create a message of a romantic opportunity waiting to happen.

There's always a question of what white balance to choose for these sort of things. You're creating an image about a warm glow. Kelvin temperatures in the range of 2,700 may be in order, to provide the ambience you are looking for. Shoot and test before striking the set. Like working with the light of sunrises or sunsets, the perfect fire illumination can be fleeting over a short period of time and plenty of patience will be necessary. There could be a few takes until you get it just right.

Tech Specs

Photographer

Janet Stoppee

Stylist

Tracey Lee

Camera

Nikon D2x - ISO: 100 • Shutter Speed: $1/4$
Manual Mode

Lens

AF Zoom-Nikkor 80-400mm $f/4.5-5.6D$ ED @ 400mm
35mm Focal Length: 600mm @ $f/8.0$

Light Meter

Gossen Starlite

Support

1 - Gitzo Explorer
1 - Gitzo Off Center Ball Head

Software

Adobe Bridge, Camera Raw, and Photoshop

It took a quarter of a second to expose our candle photo, at 3,400 K, with an ISO of 100. Limiting noise on the sensitivity side, may have offset noise with a longer speed.

We find that if a camera has a great sensor, the noise factor for long exposures is not as big of a concern as higher sensitivity. 🌸



After Dark: Mixing Color Temperatures

Night photography is filled with delicious colors and a sense of either complete stillness or the mood of nightlife in action.

There's a sense of movement on the streets with slow exposure speeds once nature's light goes down. The mood can be joyous or foreboding in the unknown.

There are many colorful light sources in our downtown areas. They are rarely the same color temperatures.

For some photographers, this is disturbing, if looking for even color balance. Other photographers want all the color temperature variety that they can find.

Your only reasonable choice is to select the temperature that suits your primary subject and let all the rest happen as it may.

To get a great exposure of those out window shopping, take an incident reading of the light from a store window at the approximate distance you want for those strolling by.

Wide-angle lenses provide a feeling of loneliness in a vast downtown. Long lenses feel like you're right there, as part of what's happening. The headlights and tail lights of vehicles add to the sense of nightlife activity with long motion blurs as they zoom by.

The colorful glow of neon and other signage contributes to the vivid imagery and sense of liveliness after dark.

Working with a color meter in a downtown space is a big help. *(If you have not read pages 146 & 147, on color meters, you'll want to get up to speed on their advantages.)*

In our night shot to the right, we enjoyed the sense of motion on the streets. It was not our intent to involve professional talent, as we wanted beautiful blurs. This was an exploration in found images. Though we are project-oriented, it's fun to get out and just wander about in search of whatever awaits us. With no specific location in mind or cavalcade of talent, crew, and equipment, it stirs our creativity to drink in all of what is around us.

We experimented with the length of the blur, shooting with the lens wide open, at $f/2.8$, by changing our shutter speed.

The incident meter reading, in front of the restaurant, was $f/2.8$, at a quarter of a second. That gave us the following to play with:

- $f/2.8$ @ $1/4$ of a second
- $f/4.0$ @ $1/2$ of a second
- $f/5.6$ @ full second
- $f/8.0$ @ 2 seconds
- $f/11$ @ 4 seconds

Remaining as inconspicuous as possible is part of the trick of catching people being themselves. A safe but not-so-prominent vantage point is a plus.

Postproduction comes in handy to enhance an after-hours image.

Back at the studio, using Adobe Camera Raw, we chose to stick with the 4,750 K temperature that we used while shooting. However, we bumped the saturation of the red to catch the streak of the passing car at the end of the sidewalk and the green of the clock. Once the image was a tif in Photoshop, we opened levels and using the eyedropper, explored how to enhance the blacks. Without deep black tones, a night photo just doesn't feel right. Levels worked better than the black slider in Camera Raw. The longer exposure @ ISO 100 didn't create any noise.

Because nightlife is filled with so much illumination, shooting with plenty of flash equipment and light modifiers fits right in. As a fair number of lighting instruments are needed for large areas, shooting with telephoto lenses confines what needs to be lit.

Rain-soaked streets and sidewalks make all the colors of the night even more dramatic, picking up reflections and giving everything a glowing sheen. For staged shoots, hosing down an area seconds before you shoot builds visual excitement.

Depending on the downtown area, security precautions could be needed. Plenty of lighting can make your shooting space a target. 🌿

Tech Specs

Photographer

Brian Stoppee

Camera

Nikon D2x - ISO: 100 • Shutter Speed: 1 second
Manual Mode

Lens

AF-S VR Zoom-Nikkor 70-200mm f/2.8G IF-ED @ 70mm
35mm Focal Length: 105mm @ f/5.6

Light Meter

Gossen Starlite

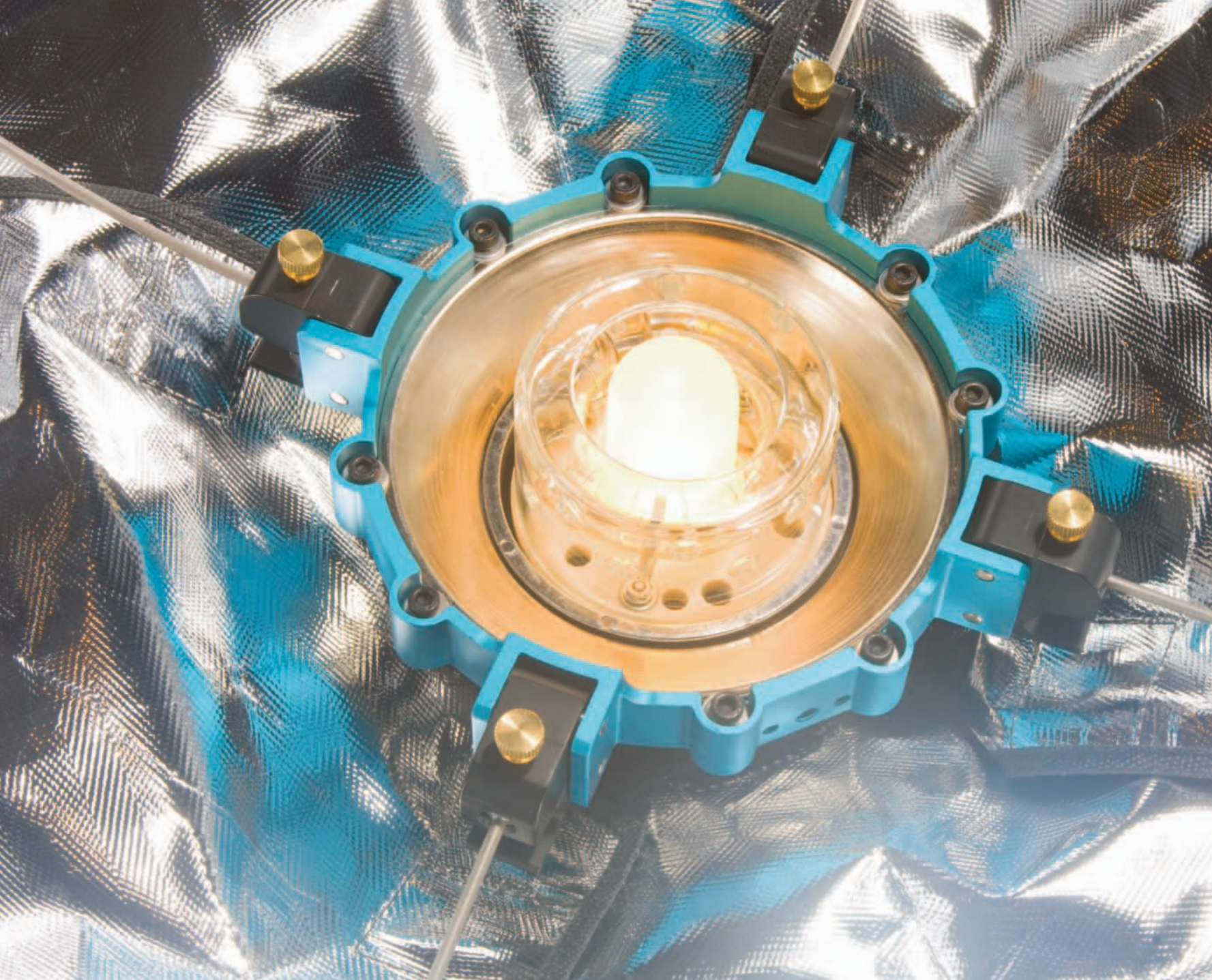
Support

1 - Gitzo Mountaineer
1 - Gitzo Off Center Ball Head

Software

Adobe Bridge, Camera Raw, and Photoshop





Man-Made Modifiers

Light strikes a surface. It reflects away from it. The light takes that surface's characteristics and shares it, wherever it goes. Take that same principle and apply it creatively to all that you photograph. Reflect what you see and share it.

Some brilliant minds have been at work developing a fascinating series of tools that assist you in manipulating light to your advantage. There are portable modifiers that harness the sun. Others are indispensable lighting instruments for artificial light sources.

These are the tools that photographers share with Hollywood, broadcast news and sports, and even at times retail display designers. Light modifiers are in the studio; they are on location. They form a commonality between the portrait studio and commercial photography. Just about any profession that creates images involving a lens must master the versatility of light modifiers.

Some are small enough to fit in your camera case and others grow to something larger than your car.

Because so many image-making professionals have integrated these tools into their day-to-day workflow, you need to master them as well, if you want to produce professional-grade photographs.

Our only warning about light modifiers is that if you have not worked with them, before, once you have welcomed them into your photographic undertakings, you are going to be less than pleased with some of the photos you have made in the past. They'll change the look of all the photos you take, for the better. 🌸

Nature Modifies Light

As we showed on pages 240 & 241, we used the power of a granite wall to bounce fill light onto the shadows of an otherwise harsh natural sidelight.

The best known reflectors of light are freshly fallen snow and white sand on a sunny day. Their reflective proficiency is so great that it can take our eyes a while to adjust.

White works well. It's clean.

The green reflections of grass are not always as welcome. They can taint the coloration of

the subject. (Green chins don't always appear healthy, for some reason).

Study Reflections

When on location, study what the light is doing and plan on how you are going to modify it, to your advantage.

If you have not read page 28 on the angles of incidence and reflection, now is a good time to do that.

Study how unwanted reflections could

mar your photo and make plans to overcome them. The next twelve pages will help you to take what you've learned about ambient light and apply light

modifiers to give your outdoor photography the polished professional look that you desire.

Once you get comfortable with using them in an outdoor environment, you'll want to bring them indoors, too. ☼

Tech Specs

Photographer

Brian Stoppee

Stylist

Tracey Lee

Illustrator

Janet Stoppee

Camera

Nikon D2x - ISO: 100 • Shutter Speed: 1/250
Manual Mode

Lens

Micro-Nikkor 200mm f/4 IF
35mm Focal Length: 300mm @ f/4

Support

1 - Gitzo Explorer
1 - Gitzo Off Center Ball Head

Software

Adobe Bridge, Camera Raw, and Photoshop
Corel Painter





Reflect Light

It's simple, once you get the hang of it. You find the direction of the light source. You position the reflector material so that you direct the harvested light onto your subject.

As simple as that may sound, the best person, we have ever known to master it, in less than sixty seconds, was seven years old.

Reflector materials come in all shapes, sizes, colors, and surfaces. It seems like we have tried to collect them all, and not one of them has suffered from neglect.

Westcott has an excellent reflector series called "Illuminator" that magically pop into a far larger shape than when you take them out of their cases. Not only is there one surface on one side and another on the opposite, but they unzip and become reversible, so that you have four surfaces in one. These options gives you such qualities of light as silver, gold, white, and a more neutral sunlight look. They run in sizes from a cute little 14" to the kite-like 52".

Matthews, the grandfather of Hollywood cleverness, has a 24" hand reflector that fits

onto a stand. It's supported by a yoke so that the reflector has a mirror-like surface on one side and it flips around to become a diffused surface on the other. It holds its position well.

The Westcott Illuminators usually require an assistant to position them for us. Sometimes models or their guardians pitch in to try their hands at it.

Rosco, the king of gels for the theatrical and motion picture universe, has some excellent reflective materials that come in rolls of 24" x 15' to 48" x 30'. They're intended for display merchandising. With the Matthews support materials that we discuss in the next chapter, you can position them for in studio use, or clamp them to the mountable hand reflector. ☼



Harvest sunlight with a Westcott Illuminator and reflect it back unto your subject. In the example to the right, reflected light fills the side of Paris's face.



Our crew tests how a Westcott Illuminator will work, as a reflector panel, before placing the talent into the photograph, at a marina.



Diffusers

So you don't want to reflect light and you don't want to flag it, either. That's not a problem. We have Plan C: Diffuse!

Who Uses It?

Diffusing light is one of the most frequently used methods for manipulating ambient light that's in the professional lighting designer's tool kit. Hollywood popularized the term "silks" for the diffusion fabrics used on sets.

Our previous use of the words "frequently" and "professional" refers to how extensive the marketplace is for products that can accomplish this high-demand means of modifying light.

On the next two pages we explore scrims and frames, the most sought-after way to diffuse light for sports commentators, at an outdoor event, or the making of a motion picture. This too has become a mainstay of the still photographer.

Whether indoors or out, on location or in the studio, we, like thousands of our fellow professional image-makers, rely on methods of diffusion.

How It Works

In the most simple terms, the diffusion material comes between the light source and the subject. The density of the fabric determines the degree of diffusion. Many manufacturers

of diffusion materials have different ways of grading them. Our chart on page 265 tries to sort all of that out.

Needless to say, these manufacturers use fabrics that are free of anything which would alter the color temperature of the light.

It's worth noting, again, that this is very different than using an old bed sheet.

Not only do standard fabrics come with their own color issues, and reflect more light than they diffuse, but to work safely you need some sort of sturdy support system so that your big kite does not take flight. 🌸



On pages 262 & 263 we discuss making frames.

Tech Specs

Photographer

Brian Stoppee

Stylist

Tracey Lee

Illustrator

Janet Stoppee

Camera

Nikon D2x - ISO: 100 • Shutter Speed: 1/250
Manual Mode

Lens

AF-S Zoom-Nikkor 28-70mm f/2.8 IF-ED @ 28mm
35mm Focal Length: 42mm @ f/4.5

Lighting

1 - Westcott 72" x 72" Scrim Jim Kit

Light Meter

Gossen Starlite

Support

1 - Gitzo Explorer
1 - Gitzo Off Center Ball Head
2 - Novatron Heavy Duty Stands
1 - Matthews 25 lb. Water Repellant Sandbag
1 - Matthews Boa Bag - 15lbs.

Software

Adobe Bridge, Camera Raw, and Photoshop
Corel Painter

Talent

Cindy Sedan



Reflection and Diffusion Tools



The multi-purposed Westcott Illuminator 4-in-1 and 6-in-1 kits contain hand held reflectors, diffusers, and flags.

The diffuser, in the Illuminator kit, is something like a hand-held version of the big frame we discussed on the previous two pages and show how to build on pages 262 & 263.

The diffuser removes the harsh edges of daylight and converts them into soft flattering tones, with an even, natural appearance.

The Westcott Illuminators start out small. A 4-in-1 kit of 42" reflectors and diffusers comes in a case that's just 18" wide.

Once you get them out, they magically pop into place at their full size.





Reducing the size of a Westcott Illuminator is an amazingly simple process. It just takes a little special wrist action. Grab the outer edges and twist inward. The flexible frame almost knows what to do. It starts going back into place. Work it down to three layers. It's easy to reshape.

The little 14" Sunlight reflector, below, collapses down to just around 5".

Flagging Light and Subtractive Reflectors

Sometimes reflecting the existing light is not the issue. The talent is squinting because there is too much sunlight. Your light maybe perfect for a background, but it's way too hot for the subject.

Flagging

Other times, you may wish to blow out a fair portion of the background.

Blocking light from the subject helps with this. You meter for the subject. If the background is lit with the same intensity as the subject, the background will be hotter if there's less light on the subject.

These techniques of blocking light, are known as "flagging." Be sure to see page 264 on the Matthews Road Rags and their Lighting Control Kits.

Subtractive

Doesn't it sound counterintuitive to say that a reflector could be subtractive? But, that's exactly what a black reflector is: it's reflection in reverse.

Just as a bright white object keeps nearly none of the light that comes its way, the blacker an object gets, the more it absorbs the light that strikes it, reflecting nearly none.

For that reason, one available side of a Westcott Illuminator is black. It's a subtractive reflector, better known as a "flag."

When shooting in a dark space and looking for deep shadows, place a black Illuminator on the opposite position of your light source. Assuming that the source of illumination is as contained as possible and that your subtractive reflector is of sufficient size, very little light, if any, will be reflected back to your subject. The lighting will be very directional.

Photofoil

No ready-for-anything assistant is complete without a roll of Rosco Matte Black Photofoil. It comes in 10' long rolls that are 12" or 24" wide. This is the kid brother of Cinefoil, which is up to 48" wide. This lighting sponge molds into just about any shape that comes to mind. It's rigid enough to hold its form. Use it to absorb light or to flag it. ☼



Sometimes it is best to completely hold back the light that is falling on a subject. This is known as flagging light. An Illuminator kit includes a black panel.



*Unzip-
ping a
6-in-1 Il-
luminator kit
reveals a second
diffuser panel, on
the inside. It also
allows the black and
sunlight panels to be
reversed making them
gold and silver.*

The Framework of Scrims

Chimera calls them “panels” and “frames.” To Matthews they are “overheads” and “butterflies.” Westcott has their own brand name, “Scrim Jim.” They’re a rigid framework that’s covered by diffusion materials.

They’re as small as Chimera’s 24" x 24" and as hefty as the Matthews 144" x 144".

No matter what their size, they collapse and fit into a relatively small duffle bag. They’re part of a whole system that has to have sufficient strength to hold up in breezy conditions. The framework must have flexibility while being lightweight.

We pack a pair of stands in their bags to go with the framework, a set of fabric options, and a pair of grip devices that connects the framework to the stands and permits us to angle the frame in the needed direction.

Again, safety is an important factor. If you have set up one of these in a darkened studio, using a black, semi-see-through bobbinette fabric, it’s just begging for someone to trip over it. On location, outdoors, you have constructed an inland sail boat. In the next chapter, we explore weighting systems.

Indoors or out, you need to be sure that these are secure.

The Chimera is the easiest to set up.

In the illustration (right) we are putting together the smallest of the Chimera frames.

The Chimera system comes with two Matthews Grip Heads. These are perfect for slipping the frame into. Just place the Grip Heads on top of two stands and pop the frame into the Grip Heads. The head allows the frame to pivot 360°.

Once the frame is in place, simply stretch the fabric over it. The fabric easily fits over each corner without any pulling or tugging.

This is great for rapidly switching out scrim materials. If a minor diffusion works at this hour, as the sun’s angle varies, a different degree of diffusion could work better. Change out fabrics as fast as you change angles.

Who Has the Best One?

You need to get into a store and try them out. Each one is very different. This is something that you have to like. Set them up. Time yourself. See how long it takes. Did it go together as fast as you thought? Now that it’s together, do you like how it operates? How long does it take to collapse? Do you like one system’s fabrics more than the?

We have found that photographers who agree on cameras, computers, software, and a host of other things may have differing opinions on scrim systems.

One thing that everyone agrees on is that they have to have them. 🌻





Fabrics, Road Rags, and Lighting Control Kit

Matthews is the leader in products with funny names. We feel good about being in such a technology-laden business that has a sense of humor.

RoadRags

The Matthews RoadRags kit is a great place to get started with professional diffusion and flag materials. What comes in a 9" x 21" x 2" thick package creates 18" x 24" diffusion frames in four fabric choices. There's a 24" x 36" version, too. These can be placed on an arm extending from a lighting instrument to diffuse some of the illumination. They're also great for softening or flagging natural illumination on small subjects.

Open-End Frames

A problem with some flags is that they leave a visible line on the subject. The Matthew RoadRags have an open end. They create a soft edge that is unnoticeable.

Fast Flags

Westcott has a similar 24" x 36" collapsible frame, "Fast Flags." Fabrics change quickly.

Fabrics Chart

We've assembled a road map to the various fabrics that various manufacturers use for diffu-

sion materials. We find it to be a valuable guide as to how much light each product diffuses and how that affects the f-stop of each lighting setup.

Grip Supports

All of these wonderful widgets need even more widgets to position them securely. Please see the next chapter for how all the arms and Grip Heads and Knuckle Heads work.

What's a "Grip?"

It's a "who" not a "what." The term "grip" comes from theatrical stagehands. It's a more popular term in the film industry or on television production sets for various crew positions who move things around and set up equipment. It's not strictly a grunt work job. Grips have a vast knowledge of technology and possess the clever, problem-solving minds that are essential in their craft.

They know their widgets! 🌟

This diffusion material from the Matthews RoadRags Kit assembles much like a Chimera light bank, with rods that pop into place.



Diffusion Material Fabrics

<i>Fabric</i>	<i>Color</i>	<i>Transmission</i>	<i>Webbing</i>
Chimera Cloth	White.....	1.25 stops	
Chimera 1/2 Grid Cloth.....	White.....	1.00 stop	
Chimera 1/4 Grid Cloth.....	White.....	0.50 stop	
Chimera Single Scrim.....	Black.....	0.50 stop	
Chimera Double Scrim.....	Black.....	1.00 stop	
Matthews Single Scrim.....	Black.....	0.60 stop	White
Matthews Single Scrim.....	White.....	0.50 stop	White
Matthews Double Scrim.....	Black.....	1.20 stops	Red
Matthews Double Scrim.....	White.....	1.00 stop	White
Matthews Triple Scrim.....	Black.....	1.80 stops	Blue
Matthews Silk (Artificial).....	White.....	1.60 stops	Gold
Matthews Silk (Artificial).....	Black.....	1.80 stops	Black
Matthews 1/4 Stop Silk.....	White.....	0.60 stop	White
Matthews 1/4 Stop Silk.....	Black.....	0.70 stop	Black
Matthews China Silk.....	White.....	1.00 stop	White
Matthews China Silk.....	Black.....	1.00 stop	Black
Matthews Grid Cloth.....	White.....	2.60 stops	White
Matthews Light Grid Cloth.....	White.....	2.00 stops	White
Westcott 1/4 Stop China Silk.....	White.....	0.20 stop	White
Westcott 3/4 Stop China Silk.....	White.....	0.60 stop	
Westcott Artificial Silk.....	White.....	1.00 stop	Gold
Westcott 1-1/4 Stop China Silk.....	White.....	1.20 stops	
Westcott Double Black Net.....	Black.....	0.40 stop	Red
Westcott 1/2 Stop White Net.....	White.....	0.40 stop	
Westcott Single Black Net.....	Black.....	0.02 stop	Green

Like the Matthews RoadRags Kits, the Matthews Light Control Kits include a series of similar diffusion materials, though they are in a rigid form unlike the collapsible RoadRags.



Tents

Not everything in lighting is done on a grand scale. Some of the most admirable work is done at a very small size. Light needs to be controlled with even more precision on tight shots of products.

Jewelry isn't an easy subject to photograph. Watches and rings have plenty of shiny surfaces. They pickup reflections from everything around them (including the photographer and camera).

A tent is something like a big fabric cone. It's zippered so that there is enough room for a lens's front end to peep in on the subject. Because the white of the tent surrounds the subject, the reflections are even.

This doesn't mean that the lighting is flat and uninteresting. The lighting options are limited only to your imagination. Surround the tent with light banks or umbrellas for even illumination, or keep your light directional, with only one soft light source, or use lighting instruments without modifiers for a more crisp look, or... well, you get the idea.

Westcott has three tents in 21" x 20", 54" x 40", and 48" x 60". When working in macro proportions, light-source-to-subject distance becomes extremely critical. Match the right size tent to the scale of the subject. 🌸



Dots and Fingers

Tiny subjects require tiny reflectors and diffusers. Some of the most commendable work that photographers do is managing those highly refined touches of light. Just as we need reflectors that are as tall as the ceilings in most homes and equally wide, when working on small subjects, we need reflectors that are only a few inches wide by a few inches tall.

Dots

These circular light modifiers resemble a lollipop. They have a spring steel frame with a pin that extends from the base. The mounting pin fits into a Grip Head or Flex Arm, which is then attached to a lighting stand or some other support.

Their frames are covered with scrim material, reversible reflectors, diffusion, or black. Matthews has them as small as 3" or as big as 10", with 6" in between.

Fingers

Something of a dot, but in rectangular form, Matthews has Fingers in all the same materials but in 2" x 12" or 4" x 14" sizes. 🌸



Barn Doors and Snoots

So much of our light modification technology still has its roots in theatrical illumination and its candle-powered efforts. As time went by, these lighting masters of the stage created the forerunners of today's ingenious tools.

Barn Doors and Gel Holders

How we shutter down light with barn doors goes back to theatrical origins. In theater, lights hang from a series of metal poles above the stage, known as “electrics.” The “first electric” is closest to the stage's proscenium arch and main curtain. The numbered electrics progress as the poles go back, or as it's called going “upstage.” To contain the light, so that it will not “spill” in places where it doesn't

belong, four-way barn doors are placed over the lighting instruments. The four doors black metal panels held to a frame with hinges, are adjusted until the light is contained. Many barn doors are also gel holders, so that colored material can be placed in front of the light source.

That's still exactly how it works with barn doors for photographic lighting. Instead of “hanging” lighting on electrics, we place lights on stands.

Barn doors are often used on instruments intended for back

lighting. It provides a three-dimensional quality, but they're available for wherever your creativity sends you.

Snoots

The cylindrical tube that we call a “snoot” goes back to the theatrical term “top hat.” Some of this light modifier covers a portion of the light source. Other snoots are somewhat conical, as if they are funneling the light rather than limiting it.



In portrait photography, the snoot is a very popular instrument for hair light. It's a great means of skimming just a little bit of light over the back of the head.

Many snoots have something of a zoom feature that allows you to extend the snoot, to maximize the focusing of the light to a very limited soft-edged spot.

When a snoot is combined with a grid (*see the opposite page*), the focus of light becomes even tighter. This tool creates great little pools of light for commercial photography. 🌟



Grids and Spots

The grid is another fabulous tool for limiting how much light is directed and how much light spills where it's unwanted.

These tools work on small instruments as well as on huge light banks.

Grids are available in a few varying degrees, in the literal sense. A tight grid would be at 20°, whereas a broader one gets out to around

90°. Because of their shape, these light modifiers are also known as “honeycombs.”

When a honeycomb is placed over a snoot, the resulting light is a very tight pool.

Some lighting instruments have optical spot attachments.



This allows for a very tight, very focused light. (Please see Chapter 11, “HMI,” for more on this.) 🌸

Though most grids are intended to fit over lighting instruments, as does the Novatron grid (left), the grid above fits over the snoot on the opposite page.

The grid, for the snoot, is excellent for tiny spots of light in portraiture or product photography.



What Umbrellas Do

There is no single lighting tool associated with any branch of the photographic profession today. At one time, umbrellas were related with portrait photography. Many portrait studios used one as a key light and another as a fill. Silver and white used to be the standards. The belief was that silver provided a more contrast-oriented light and white was the better choice for flattering images. That's what photographers thought customers would buy the most.

Big Light

Umbrellas take a small light source and create a big soft pool of light. The parabolic shape of the umbrella allows light to strike the back and sides of its surfaces and scatter light all over the place. Because it is scattered, it softens the illumination.

Everything from big studio flash to smaller battery-operated flashes work in an umbrella.

The Color of Umbrella Light

As with other light modifiers, the surface of the modifier dictates the characteristics of the light. If the surface is gold, the light is warm. White should be as pure as the light source. A

silver umbrella creates a sharper light than a white one. An observant photographer studies the subject and the mood and selects the umbrella that expresses the moment the best. In a multiple-light-source shot, white, silver, and gold can share duties.

Umbrella Efficiency

Because the umbrella tosses light all over the place, the upside is a beautifully soft light. The downside is that what starts out as a highly powerful light source has probably lost more than one stop of efficiency.

A metallic surface is more efficient than a white one.

Smaller umbrellas direct more of the light than larger ones. So the small umbrella makes the most efficient use of the light.

To prevent light from spilling all over the place, reflecting light off of unwanted colors and surfaces, use an umbrella with a black back cover. These are removable.

The Umbrella Toolkit

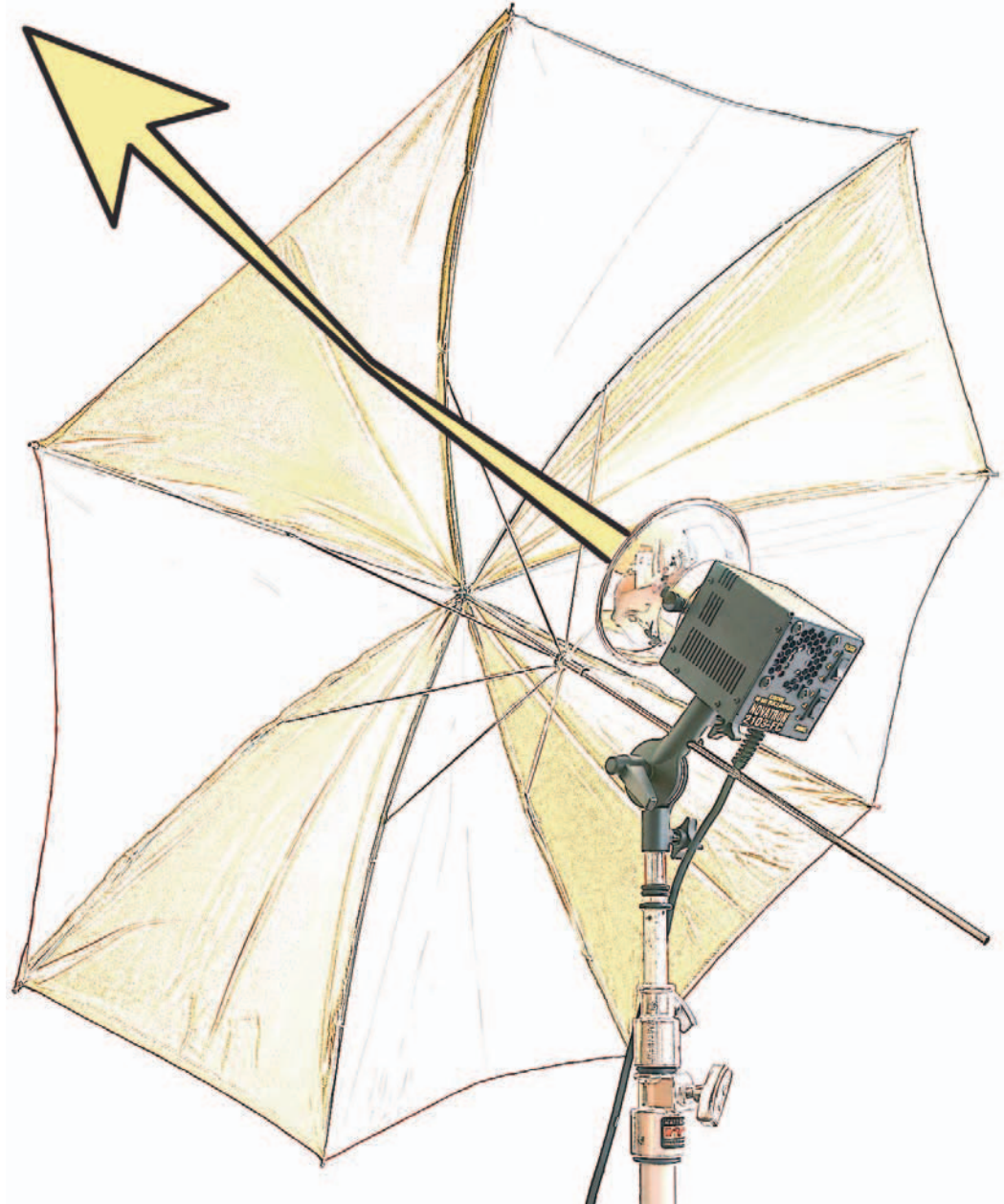
Westcott is the reigning king of the photographic umbrella. They have been in the umbrella business for over 80 years. Westcott

private labels umbrellas under some of the best-known names in the lighting business. We have been using their umbrellas exclusively for over a third of their history.

The umbrella is one of the cheapest light modifiers available. Any self-respecting professional photographer will have a huge supply of umbrellas in many sizes and colors in their treasure chest.

Make it your goal to personalize each image to your subject's best appearance.

If you shoot with umbrellas, custom-tailor each photograph to make your subject look their absolute best. 🌻



The umbrella's parabolic shape allows the light to scatter over a wide area. The color of the umbrella, as well as its size, determines the color and contrast of the light that is produced.

Multiple Umbrellas for Soft Light

In the image to the right, we have employed three umbrellas. One is our key, the other a fill, and the third one floods the background. Each umbrella is unique and has a special purpose. This commercial-oriented image was once considered to be the wrong environment for umbrellas. Today, nothing could be further from the truth.

Another three-umbrella technique is to form a triangle of umbrellas over the lens. The softness and flood of light wraps itself around the subject with more visual flattery than most subjects will ever know.

Westcott has some impressively large umbrellas, too. It takes a little rigging, but their 86" optical white oversized umbrella is a full-length shooter's dream come true. 🌸



The use of three umbrellas provides a key light, a fill light, and background light, to gain three dimensional qualities.

We have placed the three light sources to provide a fair amount of general illumination as well in this ample shooting space. Because of the white ceiling, there's a fair amount of bounce.

Tech Specs

Photographer

Brian Stoppee

Stylist

Tracey Lee

Illustrator

Janet Stoppee

Camera

Nikon D2x - ISO: 100 • Shutter Speed: 1/250
Manual Mode

Lens

AF-S Zoom-Nikkor 28-70mm f/2.8 IF-ED @ 70mm
35mm Focal Length: 105mm @ f/4.5

Lighting

2 - Novatron 1,000 Ws Digital Power Packs
3 - Novatron Fan-Cooled Bare Tube Flash Head
1 - Westcott 45" Silver Umbrella
1 - Westcott 45" Gold/White Umbrella
1 - Westcott 45" Silver/White Umbrella

Light Meter

Gossen Starlite

Support

1 - Gitzo Explorer
1 - Gitzo Off Center Ball Head
3 - Novatron Heavy Duty Stands

Software

Adobe Bridge, Camera Raw, and Photoshop
Corel Painter

Talent

Justin Mabrie

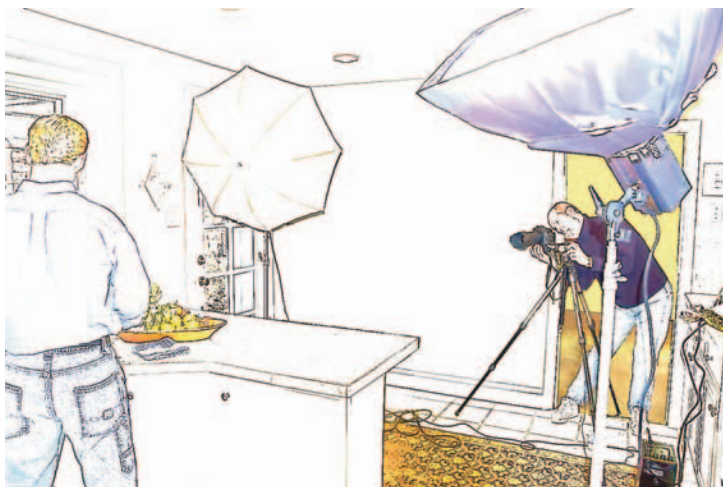


The New Umbrellas

Some umbrellas don't look like umbrellas anymore. Westcott's Apollo and Halo are good examples of this.

Our key light, in the image to the right, was shot with a Halo. It looks more like a light bank than an umbrella. The round Halo and four-sided Apollo have not lost sight of their umbrella frames. Unlike a light bank, they mount on a flash head's umbrella opening, without the need for speed rings. They're quick to set up and strike. These forward-focused designs spread light at 104° to 140°.

Another Westcott innovation is the Master's Brush which provides variations of the Rembrandt and butterfly lighting that many accomplished portrait photographers strive to create. The complete kit includes a multi-layered front panel and barn door, plus a unique internal baffle that self-feathers light between the center and the outer edges, over a 2-stop range. 🌸



Tech Specs

Photographer

Brian Stoppee

Stylist

Tracey Lee

Illustrator

Janet Stoppee

Camera

Nikon D2x - ISO: 100 • Shutter Speed: 1/250
Manual Mode

Lens

AF-S Zoom-Nikkor 28-70mm f/2.8 IF-ED @ 70mm
35mm Focal Length: 105mm @ f/11

Lighting

- 1 - Novatron 1,500 Ws Digital Power Pack
- 2 - Novatron Fan-Cooled Bare Tube Flash Heads
- 1 - Novatron M600 MonoLight
- 1 - Westcott 54" Round Halo Mono
- 2 - Westcott 12" x 36" Strip Banks
- 2 - Westcott Novatron Bare Tube Speed Rings

Light Meter

Gossen Starlite

Support

- 1 - Gitzo Explorer
- 1 - Gitzo Off Center Ball Head
- 3 - Novatron Heavy Duty Stands

Software

Adobe Bridge, Camera Raw, and Photoshop
Corel Painter

Talent

Richard Spencer



Light Bank Technology

A well-designed light bank produces a quality of illumination that resembles the softness that comes through a window.

This window-light look has been attempted by some using foam or card stock and some duct tape. This creates a hot box. It not only endangers the life of the lighting instrument that's in the box (a costly error) but could cause a fire situation or the heat could just cause the thing to fall apart and damage something, or worse, injure someone.

Nevertheless, that's the sordid history of the light bank. Many commercial photographers a few decades back became enamored with the light that their homemade contraptions could create. Over time, an entrepreneurial photographer or two created the commercially available light bank and wise professional photographers retired their favorite fire-traps once they were beyond being held together with another patching of duct tape.

What to Look For

Unless you are a studio-bound photographer and plan to set up your light bank and not take it down until you move from that address, when choosing light banks, you want ones that are easy to assemble and strike. If you shoot on location, you have to be comfortable in making that happen quickly.

Though many days (months) go into designing a great light bank it should require only a few minutes to assemble.

How It Works

There are plenty of lousy light banks available. The rods are flimsy. The fabric is thin. The speed rings are cheap. They're not designed for light efficiency. Things just don't fit together very well. Heat builds up and the fabric feels hot. Light spills where it isn't supposed to go. Illumination isn't even, with the center hotter than the edges. The whole system seems not ready for professional use.

On the next two pages, we'll get into speed rings and how to set up a light bank.

Unlike an umbrella, where the light source faces away from the subject, in a light bank, the light source is pointed directly toward the subject; yet in a great light bank, the light is very even. Why?

Light not only travels through two diffusion screens before exiting the bank, but it is also reflected off the back and scattered in many directions. Additionally, less than 100% of the light is transmitted through the internal baffle. Some is bounced back, creating an even softer light. Once the light does exit the exterior diffusion material, the bank's front panel is recessed enough to create

a black lip that prevents unwanted light spill and possible lens flare. The lip also permits the installation of accessories, such as grids or barn doors.

The interior baffle is removable to add a little more power output.

One Size Does Not Fit All

Light banks range in size from Chimera's and Westcott's 12" x 16" to Chimera's 15' x 40' F2.

Interior surfaces are available as white or silver, from either company.

Smaller banks are able to focus light into a specific area. A 24" x 32" bank is perfect for small-product photography or people shots where the light needs to be soft but directional. Choose a 36" x 48" for head shots and larger products or product photography where the light needs to surround the subject.

For full-length people shots and large product, you probably want a 54" x 72".

As difficult as it is to imagine shooting an entire car with a 24" x 32" bank, it's tough to understand photographing a mouse pad with a 54" x 72". Again, it comes down to having the right tool for the right job.

In many situations, we use a smaller bank as a key light and a larger one as a fill. We have more on this size discussion for you on pages 282-285. 🌟



Speed Rings

The speed ring is the core of the light bank. It's where the light source attaches and the place where the rods connect. That's why we believe that a speed ring has to be strong. Not only does it hold together the whole bank, but it has to withstand the weight of the light source, which can be quite heavy and places a great deal of stress on the ring, when dangling from an extended boom arm.

Next, insert the rods into the speed ring.



Start by inserting the rods into the pockets of the light bank. Be sure that they are going in the right direction. Check the light bank's directions.



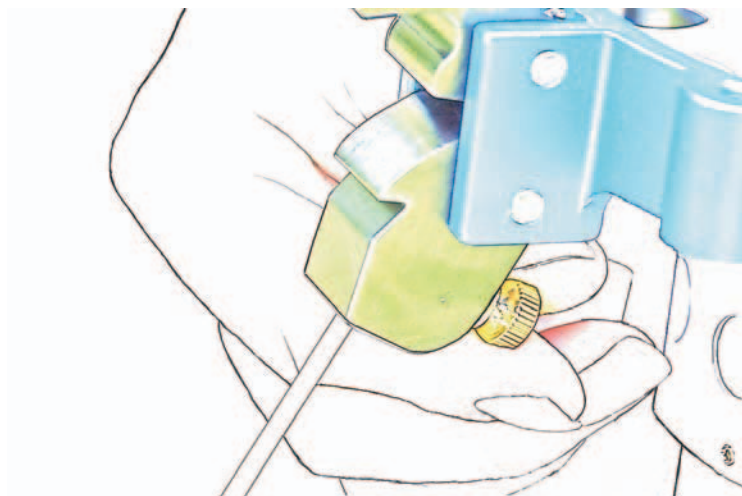
Chimera has speed rings for all sorts of light sources ranging from on camera flash units, to bare tube flash heads, to small HMI continuous lights, to some of the most monstrous lighting instruments that the motion picture industry knows.

Westcott, too, has quite a range of available speed rings.

The Bones of the Bank

The rods, which are inserted into the bank's sleeves, give the entire instrument its structure

and form. Usually, these are four poles, but for special products, like the OctaPlus, it needs eight rods.



As strong as the longer metal rods may be, they are able to be pulled apart and doubled over for convenient storage.

Quick Release

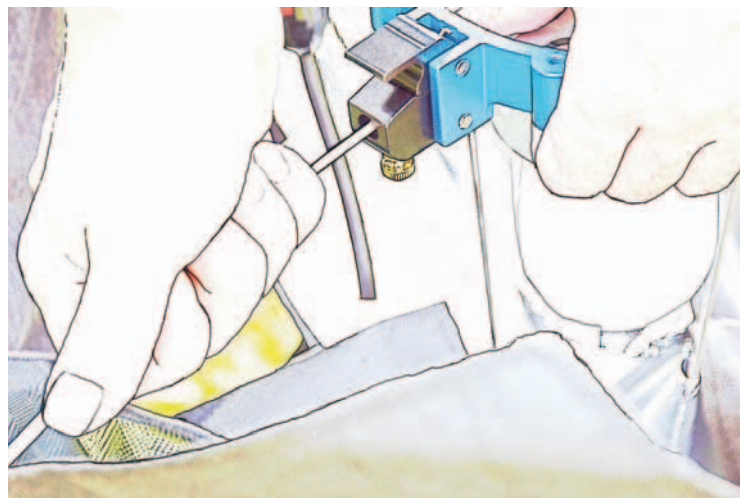
Chimera's patented Quick Release Speed Ring is the one to love. The insertion points

On the Chimera Quick Release Speed Ring you can tighten down the rods with thumbscrews.

for the rods drop down 90° from the speed ring. It's easy to insert the rods in them, secure the rods to the ring with the thumbscrews and then snap the whole thing into place.

When it's time to strike the set, wait for the light source to cool and remove it. Then, just pull up on the release tabs, and the connection block holes drop back down. There's no tugging and pulling on the rods.

Please follow the diagrams to the left. 🌀



Finally, pull the rods upward and the quick release clips will pop into place. When you're done, pull up the quick release tabs and the rods will drop down.

Light Bank Primer - Triolet

If you're new to light banks and fine artificial light sources in general, Chimera has a way for you to get started by investing in something that will last your entire career and primarily be there for you as you expand into more powerful light sources, too.

The handsome Triolet (pronounced like "try o lay") works with three different styles of lamps. There's the standard household base, a base for 650 watt 2-pin lamps, and the big Mogel base, for 500 or 1,000 watt lamps. An attractive protective glass dome assembly ought to be used with 2-pin lamps.

You'll want plenty of power, so the 1,000 watt option is probably the best way to go, unless you like the comfort of the protective dome, which is smaller than the big Mogel lamp. The 650 watt 2-pin lamp sacrifices at least two-thirds of a stop over the 1,000 watt, though. Either choice gets you

started with what's called a "hot light." Add something like a 24" x 32" Chimera Video Pro bank, light stand, and boom arm (*see the next chapter for information on support systems*), and you have an instant little tabletop photography studio.

The only downside of the Triolet is that hot lights are not the best choice for people photography. There's just not enough power to capture movement, and it can require either a shallow depth of field or a slower shutter speed. How-

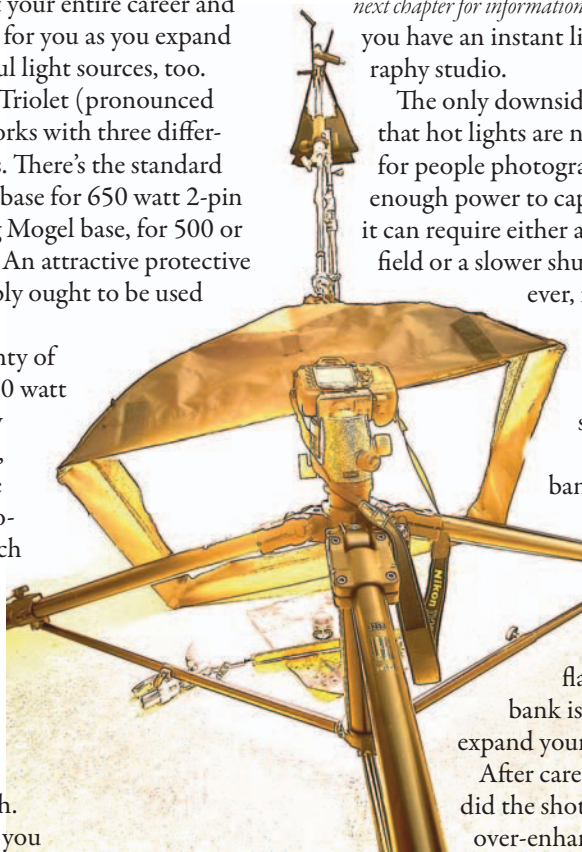
ever, for still life, you can mount your camera to a tripod and go for longer shutter speeds.

We suggest the light bank designed for video, because it's tested for up to 1,200 watts of hot light power, but if you wanted to get into

flash later, the video bank is just fine when you expand your system.

After careful consideration, we did the shot to the right without over-enhanced reflections on

the upper right side of the loupe, feeling that the darker areas gave it depth and popped it out of the background. ☼



Tech Specs

Photographer

Brian Stoppee

Illustrator

Janet Stoppee

Camera

Nikon D200 - ISO: 100 • Shutter Speed: 1/125
Aperture Priority

Lens

AF Micro-Nikkor 60mm f/2.8D
35mm Focal Length: 90mm @ f/2.8

Lighting

1 - Chimera Triolet - 1,000 watt Mogel Base
1 - Chimera 24" x 32" Video Pro Plus One - Small
1 - Matthews 2" x 12" Silver Finger

Support

1 - Manfrotto Tripod
1 - Gitzo Center Ball Head with Quick Release
1 - Matthews Baby Jr. Double Riser Stand
1 - Matthews Baby Boom
1 - Matthews Magic Finger
1 - Matthews Gaffer Grip
1 - Matthews 20lb. Saddle Bag

Software

Adobe Bridge, Camera Raw, and Photoshop
Corel Painter



The Big Bank

We love working with large light banks, even on location. They setup in minutes.

Playing It Safe

Though we were at the indoor lobby of a biotech park building, we still balanced the Matthews Magic Stand's Runway Base with one of their 25 pound sandbags. We then hung a Matthews 15 pound Boa Bag from the back end of the boom arm, to keep everything stable. Additionally, in whatever direction the boom is pointing, we position the base so that the boom arm has a wheel, directly under it. That prevents it from tipping over.

We wanted the look of medical professionals conversing in a big space and the sense of their professional rapport. Rather than flood the space with light, we chose just one Chimera 54" x 72" Super Pro Plus - Silver. It keeps the lighting soft. The shadows are not unattractive, but the darker background gives the sense that they are working within the confines of their highly specialized field. We wanted the look to say something about the medical profession helping others. To add to this, we shot from the floor, looking slightly up, to provide a little more of a power position.

With a light-source-to-subject distance of approximately 6' above the talent's head, we had a very even spread of light. This worked

well in containing the light to the main action with just enough fall-off as to not spill elsewhere in the room.

We try to shoot two stops down from the 1,000 watt-second power pack's full power. This provides plenty of recycling time when working with people. (Please see Chapter 13, "Digital Studio Flash," for more on this.) 🌸



When shooting indoors or out, always secure lighting instruments and cables. Create a safe working environment for everyone. This is important in a public space. When hanging a large instrument from a boom arm, properly balance and weight it.

Tech Specs

Photographer

Brian Stoppee

Stylist

Theresa Lent

Illustrator

Janet Stoppee

Camera

Nikon D2x - ISO: 100 • Shutter Speed: 1/250
Manual Mode

Lens

AF-S Zoom-Nikkor 28-70mm f/2.8 IF-ED @ 28mm
35mm Focal Length: 42mm @ f/4.5

Lighting

1 - Chimera 54" x 72" Super Pro Plus - Silver
1 - Chimera Novatron Bare Tube Quick Release Speed Ring
1 - Novatron 1,500 Ws Digital Power Pack
1 - Novatron Fan-Cooled Bare Tube Flash Head

Light Meter

Gossen Starlite

Support

1 - Gitzo Explorer
1 - Gitzo Off Center Ball Head
1 - Matthews Magic Stand with Runway Base
1 - Matthews 25 lb. Water Repellant Sandbag
1 - Matthews Boa Bag - 15lbs.

Software

Adobe Bridge, Camera Raw, and Photoshop
Corel Painter

Talent

Sherrie Hagan
Peggy Jackson
Jay Pearson
Elizabeth Prom Wormley



When Smaller's Better

To properly light our peas and pearls we needed the perfect-sized light bank. One that is too large would flood the pearls, spreading highlights over the gems. A smaller bank would give us harder highlights. We needed to balance proper exposure for the peas and pearls at the same time. The Chimera 36" x 48" Shallow Plus Bank was the perfect candidate for the job.

Styling to Perfection

This is where so much of the shot is made by an ingenious stylist who has the props to make it happen at hand. Moving things a little this way and a little that way, while the photographer is watching in the viewfinder, is critical. Keeping the peas intact is a bit of a balancing act, whereby careful movement is necessary for the set to look fresh.

Light Source Size for Highlights

The light source is one bare tube head with a 250 watt modeling lamp. The fan-cooled head and the light bank allow the head to vent to the back. So the set remains cool.

In a tabletop environment like this, big flash power is not needed. We wanted a shallow depth of field so that the focus was on the spheres in the foreground, allowing the peas that are deeper down to fall out of focus.

We had to dial the 1,000 watt-second power pack way back. A 600 watt-second monolight would have been more than sufficient.

The Right Lens

A 60mm macro lens is perfect for this situation. We're shooting with a Nikon D2x, so the equivalent focal length for 35mm film is 90mm. It's close to a 105mm macro lens. At $f/6.3$, we have enough telephoto compression to slightly flatten the perspective on the little white and green orbs. 🌸



Choose a lighting instrument that provides the quality of illumination to fit your vision. Specular highlights mirror the light source. The size of the light bank determined the size of the highlights.

Tech Specs

Photographer

Janet Stoppee

Stylist

Tracey Lee

Illustrator

Janet Stoppee

Camera

Nikon D2x - ISO: 100 • Shutter Speed: $1/250$
Manual Mode

Lens

AF Micro-Nikkor 60mm $f/2.8D$
35mm Focal Length: 90mm @ $f/6.3$

Lighting

- 1 - Chimera 36" x 48" Shallow Plus Bank
- 1 - Chimera Novatron Bare Tube Quick Release Speed Ring
- 1 - Novatron 1,000 Ws Digital Power Pack
- 1 - Novatron Fan-Cooled Bare Tube Flash Head

Light Meter

Gossen Starlite

Support

- 1 - Manfrotto Tripod w/Quick Release Head
- 1 - Matthews Baby Jr. Double Riser
- 1 - Matthews Baby Boom
- 1 - Matthews Boa Bag - 15lbs.

Software

Adobe Bridge, Camera Raw, and Photoshop
Corel Painter



OctaPlus Banks

Not all soft banks are rectangular. The Chimera OctaPlus Banks double the sides, but the OctaPlus 57 keeps changing in size.

5' Now; 7' Later

This eight-sided light bank converts from a 5' OctaPlus into the 7' one. The OctaPlus 57, with tools, uses a unique expansion kit to become two banks in one. Striking a median between white and silver, this bank's soft silver interior has an exclusive graduated baffle. The spread of light is both even and highly efficient.

Just as there are light banks for flash and others for hot lights, the OctaPlus takes the heat at up to 1,200 watts.

This 60" or 84" super-soft umbrella also has a 36" fixed-size kid sister, who, when compared to some umbrellas, is a not so small child. All of them are great for people shots. The big kids are fantastic for full-length, especially fashion and groups. This is one of those rare occasions when one size (that's really two) practically fits all.

The standard Chimera speed ring doesn't work here, because this has eight poles instead of the usual four. Use the special OctaPlus speed rings for these creatures.

Follow how the OctaPlus 57 goes together and converts, to the right. 🌞



This five foot OctaPlus easily expands into a seven foot eight-sided light bank.



A special designed internal baffle ensures an even illumination.



The five foot bank grows to seven feet with the simple extension system.



That internal baffle can be retained after extending the bank to seven feet.



When extended to seven feet, the adjustment easily adheres.

Lanterns, Pancakes, and Skirts?

Proving that Matthews does not have exclusive providence to funny names, Chimera has yet another clever lighting instrument that would appear to have been inspired by frequent visits to a Japanese beer garden.

The Lantern

The lantern is another light bank that doesn't look like a light bank and takes on many lives.

For the photographer, the Lantern is an overhead soft light, hanging from a serious boom arm, like the Matthews Junior Boom, which extends to over ten feet. The Lantern can be a single source light or a light source that others are built around. It's a big interior shooting space fill light.

It's best with bare tube flash heads, so that the light spreads all over the place.

It's great for HMI soft light heads, too.

Pancakes

All of these Chimera specialty light banks work with flash or hot (cakes) lights.

The 20" diameter Lantern is 16" deep and the 30" Lantern is 26" deep. A 21" diameter Pancake is only 12" deep. Its 35" and 48" cousins have similar diameter-to-depth ratios.

The Lantern has a reflective back panel, like a standard light bank, whereas the Pancake is open on all four sides. This works well in some applications but spills light all over the place in other uses. Obviously, it needs to be controlled.

Skirts

Chimera has given the controlling authority over that spilling light to a skirt.

Quite logically, a skirt is a removable, zippered panel. It allows you to manage the light's fall-off, much as you would with a barn door on other lighting instruments.

How to Go Horizontal

Because photographers like the look of the Lantern's or Pancake's light, when they're parallel the ground, first you probably need to mount it on a boom and then straighten it out. Please see the

Drop Downs and Magic Fingers discussion on pages 310 & 311.

Creative Lighting Design

To put all of this into maximum use, you need to open your creative mind to full throttle. You can't think in terms of standard lighting instruments. Instead, you have to be like the photographers who made their own light banks out of suboptimal materials a few decades back. Consider these tools and imagine the possibilities. 🌸



For some applications Chimera's Lantern and Triolet are a perfect combination.



In the photo, above, the Lantern has the reflective back panel attached. In the image to the right, there is no panel in use. Notice the difference in the intensity of the shadow, that we purposefully created.



Filter Basics

There's something magical about being able to change the color of light in a dozen different ways, in less than a minute simply by placing sheets of colored plastic in front of the light source. Once you get over the thrill, it becomes a studied, creative expression that you can fine-tune through exploration.

The Swatch Book

To get started, pick up a colored media swatch book. These are available for free, from select photo retailers, theatrical supply houses, or directly from the manufacturer.

The longstanding name synonymous with gels and filters for stage and film is Rosco. They have a huge catalog of media.

Their Cinegel line is extensive, and even though it is the grandfather, Rosco regularly adds new colors. Their swatchbook is more than a hand full of pretty colors, it includes valuable technical information for each gel.

How Gels Work

A colored gel is something of a gateway for wavelengths of light. It permits the transmission of some spectral energy and absorbs the

rest. Going back to the red, green, blue color models, imagine a red filter permitting the wavelengths relative to red to pass through the filter and onto the event, with the blue and green ones being refused admission to the lighting party.

Stability and Safety

On initial examination of filters, “stability” is not a word that immediately comes to mind. It's a thin flexible medium. These big beautiful sheets of color are so inexpensive and easy to cut into pieces that at first they either seem disposable or too precious to ever want to mar. Gels are fun.

Lousy gels are serious business. The absorption of energy builds heat. Poor heat stability not only degrades the quality of the filter, but can also be a fire hazard.

Even the best filters need room to breathe. Not only does the filter absorb some of the light energy if improperly adhered to a lighting instrument, but it also prevents the light from being able to perform with proper coolness.

Stable cool media lasts a long time in total safety, so it's not to be feared. Consider the

gelled lights in theaters, where shows run more than once a day with the same color media and operate without a hitch.

Spectral Energy Distribution

Each color in the Rosco swatchbooks have a little piece of white paper behind them. It helps you see the color more plainly, but it has some good information on it, too. There's both a transmission percentage and a graphic.

The baseline of the graph represents the wavelengths of light expressed in nanometers (nm), running from left to right and from blue to green to red (in the most simple terms). The top to bottom side of the graph shows how much of the wavelength transmits.

Transmission Percentage

Even if the graph doesn't rev you (though it should), check out the transmission percentage of each color, which has quite an effect on the success of the image you want to create.

A mainstay of theatrical lighting is Rosco 02 Bastard Amber: 78% of the light is transmitted through this color. There's not a preponderance of light intensity that is lost.

Something as vibrant as 65 Daylight Blue, however, transmits only 35%.

If you had two lighting instruments with one of each of those gels in front of them, your light meter would measure more light from the amber than it would the blue.

Bastard Colors

Much of the available color media are blends of color, rather the pure chroma. The colors are based on market demand. We are often looking for light that appears neutral and natural. That's what is achieved when the predominant color is blended with a little bit of a complementary color. A bastard orange is a pure orange with a minor amount of blue worked into it. The result is a pleasing warm color tone.

Gelatin?

Most gels are no longer a gelatin. When Rosco got started in 1910, they did make colored gels. By the 1950s color filters, like the Roscolux, went onto a polycarbonate base. It's a durable polymer.

This has taken the fun out of asking overconfident assistants to wash off a beat-up color gelatin carefully, in warm water, and watch the look on their faces when it returns to a liquid state.

Today, dyes are introduced to their polymer bases by either surface-coating, deep-dyeing, or creating a material with the color in the body of the material.

Surface-coating basically paints a color on a piece of plastic. It's inexpensive to manufacture and uses no heat, so it's not a heat-resistant filter. It's easy to figure whether you have one of these: put a little nail-polish remover on the color and it will dissolve.

Rosco's Cinegel line is deep-dyed. The color is suffused to the polymer and more heat-resistant.

Roscolux, at 4 mil thickness, has a color base that is sandwiched between resins melted together at close to 600°F. The result is a high-performance color medium. 🌟

Lighting Designer Color Tricks

Broadway's stellar lighting designers, who have a few Tony awards to call their own, have a few standard tricks that they do with color filters. Hollywood uses some of these, too.

We know very few professional photographers who employ these color conventions in their photography. Those photographers who do employ these little secrets create a very special look to their images that you may not be able to point to and instantly exclaim, "Ah ha! 305 Rose Gold!" but you can tell that their light has beautiful tones of color that resemble nature's colors.

Create Color Moods

Please carefully study the charts to the right. They are a quick guide to some of the commonly used filters for warm and cool moods, plus accent colors and colors that imitate natural conditions.

The best way to sort these out is to quickly knock out a bunch of test shots with similar color tones and examine the effect. Keep the transmission numbers in mind, because as you hold these up to the light source, a color that reduces the light's transmission by a third of an f-stop will look different than one that reduces it by a full stop.

It's a reason to pop a Cinegel swatchbook in the bag with your light and color meters. 🌟

Filter	Name
02	Bastard Amber
316	Gallo Gold
3411	Roscosun
16	Light Amber
310	Daffodil
12	Straw
2003	Storaro Yellow
18	Flame
23	Orange
325	Henna Sky
3220	Double Blue Bright
364	Blue Bell

Purpose

A great fair skin tone enhancer with the look of strong sunlight.
A sense of natural sunlight.
Good for strong morning sunlight.
Hints at an afternoon sunset.
The feeling of a morning sunlight.
The feeling of a bright day.
Strong sunlight, later in the day.
The look of a great sunset, in the making.
Romantic sunlight streaming through windows, at evening.
Light coming from a fireplace.
Nighttime or moonlight.
Beams of moonlight.



Diffusion Materials

As we have been discussing, there are many ways to diffuse light. Sometimes the quickest remedy is to place diffusion material over the lighting instrument, much as if it were a filter.

There is not a universal diffusion material that answers all needs. As with choosing filters, these materials are so inexpensive that there's no good reason for you to not have a library of them to choose from, as the needs arise. Again, pop them into the frame of a barn door or gel holder and test a few.

Tough Diffusion?

Rosco uses the term "tough" to denote that their diffusers are heat resistant. The base material is a polyester. It even works safely on high-wattage lighting instruments.

Tough Spun

This group of three diffusers feathers the edge of the light's beam while smoothing the field, allowing the shape of the beam to be retained without causing the angle of illumination to spread dramatically.

As with any diffuser, contrast will be reduced, but with the tough spun group, the degree of diffusion is minimal.

These are more flash oriented than for HMI, as the HMI can make the texture of the diffuser visible in its beam.

For photographers, these are available in two grades from the more intense to the less diffuse: 3006 Tough Spun and 3007 Light Tough Spun.

Tough Frost

Tough Frost is the most popular diffusion material among photographers. Unlike the tough spun group, which resembles a fabric, the tough frost materials look more like colorless frosted filters. Their diffusion characteristics range from slight to moderate. Therefore they have a moderate beam spread. They offer some contrast reduction as well.

For photographers the most popular include 3008 Tough Frost, which diffuses and has a "warm" center. 3010 Opal Tough Frost is excellent for HMI, with minor transmission loss. 3040 Powder Frost has only a moderate amount of diffusion.

Tough White Diffusion

This group offers a moderate to significant diffusion, in three even grades: 3026 Tough

White Diffusion, 3027 Half Tough White Diffusion, and 3028 Quarter Tough White Diffusion. It's named for the white pigment that is included in its manufacturing process. These diffusers reduce the shadow from the instrument's beam.

Though Rolux

The two Rolux diffusers, 3000 Tough Rolux and 3001 Light Tough Rolux, are used to take two light sources and offer the appearance of one beam of light, because of their wide beam spread and shadowless effects. Their reduction in contrast is noticeable.

Grid Cloth

Rosco has 48" wide rolls of grid cloth that is a reinforced woven polyester material in three grades: 3030 Grid Cloth, 3032 Light Grid Cloth, and 3034 Quarter Grid Cloth. The contrast reduction is considerable. It's so rugged that it can be sewn and grommetted. It also comes in 60" wide rolls of a similar material that is noiseless in windy conditions. ☼

Reflection Materials

Take one reflection panel, like the Matthews Aluminum Hand Reflector, and give it many purposes by clamping different reflection materials to it.

Rosco has some great reflector materials. The letters in their product names indicate how much surface texture they have and the light quality of their reflection:

- 3801 Roscoflex M (mirror)
- 3802 Roscoflex H (hard)
- 3803 Roscoflex S (soft) - pictured top
- 3804 Roscoflex SS (supersoft)
- 3805 Roscoflex G (gold) - pictured 2nd
- 3808 Featherflex S/W (silver or white)
- 3812 Featherflex S/G (silver or gold)
- 3813 Thin Mirror S (silver)
- 3814 Thin Mirror G (gold)
- 3809 Roscoscrim (textured/perforated) - pictured 3rd
- 3830 Spun Silver (spun silver foil) - pictured 4th. 🌸



Polarizers

One of the most magical filters you will ever put over a light (or two) is a polarizer.

The polarizer reduces glare from a subject. It is not a replacement for the polarizing lens that you put on your camera, but the principle is the same. Using polarizing filters on a couple lights, in conjunction with a polarizing filter on your lens, is known as “cross polarization.” Unfortunately, it can produce a more deeply saturated image, so it’s not a panacea.

This method requires a bit of experimenting to optimize its effectiveness. You have to develop a sense for how much reflection you want to reduce.

Try rotating the polarizing filter on the lighting instrument.

Rosco’s 17" x 20" sheets are perfect for use on a 16" pan reflector. Experiment with two lights at around 45 to 55° from the subject.

This approach works on crystal, metal, high-gloss surfaces, and even water. It’s an excellent solution to the hot spots that these reflections produce. With the filters, you can keep dialing out the reflections as you rotate them.

Fire off a few variation shots. 🌸



Color Correctors

Sure, you can accomplish plenty with the white balancing controls of your digital camera. However, when you are deal with mixed light sources that are unwanted, your only response is to correct the light source.

Crafty photographers, like cinematographers, rely on filters and a little tape.

A kitchen's concealed fluorescent tube wrapped in Rosco 3309 3/4 Minusgreen converts the green of cool white fluorescent to daylight. Only 65% of the light is transmitted. However, with Rosco 3313 Half Minusgreen, there is not as much correction, but 71% of the light is transmitted.

If you have white balanced to tungsten, use a 3310 Fluorofilter over the fluorescent tube.

You can do the same with tungsten lamps.

When you have many fluorescent fixtures, you have a challenge that's impractical to resolve by filtering all of them. Make it easy. Add 3309 to your flash instruments and white balance your camera to fluorescent

Use the handy chart to the right to balance light in just about any situation. Be careful of the transmission percentages.

Remember to allow the fixture that you are covering enough space to breathe. 🌸

To Increase Kelvin:

<i>Filter</i>	<i>Purpose</i>	<i>Transmission</i>
3202	Full Blue CTB Converts 3,200 K tungsten to 5,500 K daylight.	36%
3203	Three-Quarter Blue CTB Converts 3200 K tungsten to 4,700 K daylight	41%
3204	Half Blue CTB Converts 3,200 K tungsten to 4,100 K.	52%
3206	Third Blue CTB Converts 3,200 K tungsten to 3,800 K	64%
3208	Quarter Blue CTB Converts 3,200 K tungsten to 3,500 K	74%
3216	Eighth Blue CTB Converts 3,200 K tungsten to 3,300 K	81%
3220	Double Blue CTB Converts 2,800 K tungsten to 10,000 K daylight.	10%

To Decrease Kelvin:

3407	Full CTO Converts 6,500 K daylight to 3,200 K tungsten (or 5,500 K to 2,900 K)	47%
3411	Three-Quarter CTO Converts 5,500 K daylight to 3,200 K tungsten	58%
3408	Half CTO Converts 5,500 K daylight to 3,800 K	73%
3409	Quarter CTO Converts 5,500 K daylight to 4,500 K	81%
3410	Eighth CTO Converts 5,500 K daylight to 4,900 K	92%
3420	Double CTO Converts 10,000 K daylight to 2,400 K	23%
3441	Full Straw CTS Converts 5,500 K daylight to 3,200 K tungsten	50%
3442	Half Straw CTS Converts 5,500 K daylight to 3,800 K	73%
3443	Quarter Straw CTS Converts 5,500 K daylight to 4,500 K	81%
3444	Eighth Straw CTS Converts 5,500 K daylight to 4,900 K	92%

To Remove Green:

3309	3/4 Minusgreen CC22.5 Magenta for balancing fluorescent/discharge lamps.	65%
3313	1/2 Minusgreen CC15 Magenta for balancing fluorescent/discharge lamps.	71%
3314	1/4 Minusgreen CC075 Magenta for balancing fluorescent/discharge lamps.	81%
3318	1/8 Minusgreen CC035 Magenta for balancing fluorescent/discharge lamps.	89%
3310	Fluorofilter Balances Cool White Fluorescent to Tungsten	36%

Blue and Green Screens

We've all seen pictures of a broadcast news studio with the meteorologist delivering the weather segment in front of a green wall. Of course on our televisions, we see the same person standing in front of animated maps of radar and satellite imagery.

Color

This green or blue screen technology is generally referred to as “digital compositing” or “chroma key.”

Whether the screen is green or blue is not as important as the subject not wearing clothing of the same color. That makes it tougher to knock the background out of the image. Have you ever seen a meteorologist wearing a bright green tie? If so, you would see the map where his tie appears.

Lighting

Even illumination of both the subject and the background makes it easier to remove the background color in postproduction and replace it with something else. The typical lighting setup is similar to what we discussed for polarizing filters, two pages back.

If the subject is too close to the screen, they can cast a shadow on it, making postproduc-

tion more cumbersome, or the screen's color will reflect back on them. (Green and blue highlights on flesh are rarely considered to be a healthy look.) Making this quick and painless is the trick to chroma key.

Having the background image in hand is helpful in planning how to light the subject. For it to look natural, the light quality and angle of illumination need to match.

This is a good job for light banks.

Try to have as much light on your background as on your subject. This is best at a 1:1 lighting ratio. If you meter your subject at $f/8$, light your background to $f/8$ too.

DigiComp Media

To make this all the more fun and to rev both your technical and creative imaginations, Rosco has introduced a slew of products they call “DigiComp.” They have paints, tapes, and fabrics, in red, green, and blue. (Red isn't used much in chroma key with people, because it too closely resembles flesh tones.)

These tools allow you not only to use a big roll of the fabric as a background, but you can also paint things the same color and knock them out as well in post.

If your model is to be holding something of incredible weight, in one hand, a DigiComp blue object and matching background makes it all possible without too much postproduction time.

The paints are a flexible vinyl acrylic binder, so they adhere well to many surface types and clean up with ease. Unlike some tapes, these do not leave behind any sticky residue. The fabrics are 100% cotton and impregnated with color.

Having the entire system match is crucial to making this work.

Postproduction

If it's done right, by the time you get to Photoshop, a simple **Select > Similar** should do the job after choosing a portion of the background. Because you want to be sure that the new photo that is merging with the existing one works, you'll want to be able to see a test of the composited image, right away. 🌟





Creative Support and Safety

Okay. You buy the idea that a great light stand is all about safety. That's an easy sell. But we expect you to believe that there's something creative about a tripod?

You'd better believe it!

This whole chapter is devoted to clever things that you can do with support systems. The operative word is "system." Once you begin to establish support that has interoperability, you'll see all sorts of creative possibilities that you have previously missed. Getting a light or a widget to do this, that, or the other thing not only brings solutions to challenges, but also opens new ways to explore new photographic concepts.

Going without all the support systems that you need is like trying to complete the jigsaw puzzle without all the pieces. Not only do you not get the whole picture, but it tempts you to make compromises. Sometimes these improvisations lead to a less-than-safe setup.

A good support system makes for an extra-safe work environment. Great support not only prevents expensive equipment from being damaged, but also contributes to the continuing good health of involved personnel.

Working accident-free is a responsibility that you have to take seriously.

If your tripod and its head are not helping you find fast creative solutions, you need a new tripod. 🌟



Stand Requirements

Let's help you establish a few ground rules as to what you must demand from a stand.

The Ultimate Lighting Stand

For starts, dream. Every veteran of lighting has that ultimate stand. Ours exists. We're after versatility.

If we could have only one stand in the world, it would be the Matthews Magic Stand with it's Runway Base. It goes through a metamorphosis of being just 54" tall to becoming 150" tall, to a portion of the stand converting to a boom. The legs on the runway base collapse, nested next to each other, or completely remove. Since the wheels lock or swivel, they track in a straight line. The stand's top riser is a Magic Finger. *(See page 311 for a lesson on what that's all about.)* Since it separates into two distinct segments, it's even light enough to move around (though hardly a feather weight).

The Baby Stand

All the magic isn't about being big. You need a tiny stand to get into little places. Sometimes you need to hide a light behind someone. The trick is that a little steel stand, as low as 20" high needs to securely hold a lighting instrument that's worth quite a few

hundred dollars. So much is at stake to trust that kind of investment to some lousy support that could fall over and break and shatter the instrument. We use the durable little Matthews Mini Preemie Baby for this.

We also go way down low with a little stand that's a propped-up stub on the ground. The Matthlink has a standard leg and a flexible one to get in tight places.

The All-Around Stands

You need a few stands to do some serious grunt work. They have to be able to cope with a great deal of stress, weight, and to hold their position. Many poor-quality stands tend to "drift" or "creep," meaning that you have a tough time locking their position and they start to shrink, a little bit at a time. These stands are pushovers. The legs are not prepared to withstand both the weight of a large light bank and the force that winds exert upon them. They topple over or bend with time.

You need a stand that climbs to over 5' for seated subjects. We use the Matthews Preemie Baby, the slightly larger version of the little backlight stand.

Rolling Stands

Once a setup is together, you always need to fine-tune it. If the equipment that it supports is quite formidable, picking it up off the ground and moving it is not an option.

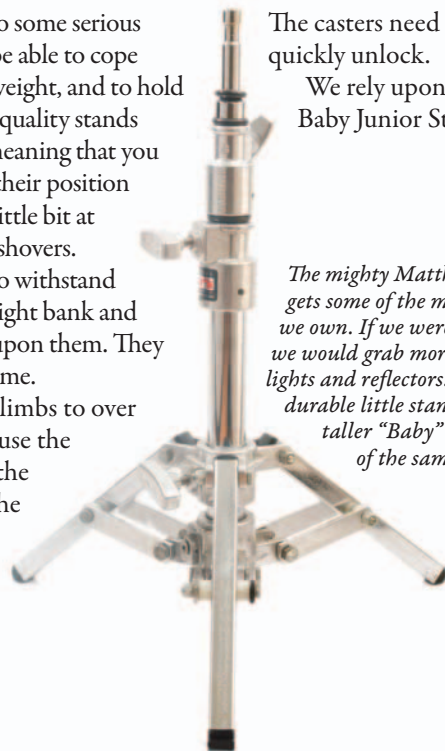
Here, you need a stand that not only rolls but can support at least 80 pounds.

Each segment of a stand that adjusts up and down is known as a "riser." Look for two or three of these to take you from around four or five feet to around eight to twelve feet.

The casters need to securely lock down and quickly unlock.

We rely upon the Matthews Hollywood Baby Junior Stands. 🌸

The mighty Matthews Mini Preemie Baby stand gets some of the most use of all the stands that we own. If we were to pick up a few more stands, we would grab more of these. It's super for backlights and reflectors. The Preemie Baby is the most durable little stand we have ever met. Its much taller "Baby" brothers and sisters are born of the same dependable stock.





Stands that roll are not a luxury. When big heavy gear is mounted on them, they are a must-have for making incremental adjustments effortlessly.



The Magic Stand wins our “Best of Show” award for the finest lighting stand in the business. It’s a do-it-all support that breaks down for easy transport.



C Stands vs. Inclines

In 1974, the Matthews C-Stand started its rapid journey to becoming synonymous with Hollywood filmmaking. It didn't take commercial photographers long to join in accepting this radically new approach to light stands as a must-have in their arsenal. Instead of folding up, it collapses flat, or the legs detach from the rest of the stand.

C-Stand is short for Century Stand. The name goes back to motion picture production, prior to artificial lighting. Stages would revolve to allow lighting with overhead illumination from the sun. Large reflectors were positioned to kick the sunlight onto the stage. The most popular reflector was called "century" because it was 100" in size.

What we now call the Century Stand was originally built by grips and gaffers and was welded together and unable to fold or adjust.

Part of what makes them so beloved is that they adapt to inclines. While two legs remain on level ground, another leg rises up to fit on a stair step or box or inclining terrain. It basically adapts to its environment.

In chrome or black, the C-Stand is either highly visible or nonreflective. 🌸





Crate and Riser Systems

Who would have guessed that a longstanding centerpiece of high-dollar image-making is an inexpensive plywood box?

The nine-ply Baltic birch crates, called Apple Boxes, are a central part of the C-Stand system. With all the right-sized holes and openings precisely in the needed positions, these 12" tall boxes come in eight different sizes, performing all sorts of handy tasks.

How you use them is limited only to how technically creative your mind may be. Problem solvers love the Apple Box. It becomes something of a game as to the different ways to configure them with the rest of the Matthews gear.

When a photographer first introduced us to the Apple Box, we were certain that he had lost his mind for wanting to buy a plywood box that he could surely make himself, until we saw one. This product is so durable and precise that to attempt to make one yourself would cause people to think you either have had no image-making work to do in months or have lost your mind! 🌻



As with all things Matthews, the crates integrate with other Matthews equipment to form a greater system.

A good reason for the holes on either end of the crates is to allow them to interact with support arms. Here, two C-Stands and their support arms effortlessly hold up a crate, which is able to balance a camera, a bottle of wine, and much more.



Arm and Boom Solutions



The boom arm is essential in how we light a set. Though they have been part our support apparatus, for decades, without any accidents, every time we hang a light over a person, we check, double check, and check it again to be sure the entire rig is secure.

We have these horizontal supports that range from an arm that's less than a couple of feet, in length, to a boom that extends to ten feet and weighs forty-one pounds.

Getting a lighting instrument in just the right place, yet, out of that camera's view makes a shot. We try to mimic natural illumination, as best we can. It's the look of our photographic style. Light comes from above. We just can't get there with only the vertical support of a stand.

You have to get horizontal.

Starting Small

Arms are not always of industrial-strength proportions. We try to keep the scale of a setup, in mind.

The C-Stands that we feature, on pages 302 & 303 come with their own arms. Most of them are 40". They're also available at 20". They're quite rugged little arms with a Grip Head attached that lets us angle them at the right degree. If we can get the job done with them, it's our first choice.

Sometimes we just need to come out a foot and a half to two feet from the lighting stand. All we need is an extendable arm. These are great in getting something to peek out over a set

piece. It's completely a horizontal adjustment. These need to be properly counterbalanced, for safety.

The Basic Boom

The arms are great for smaller needs, and often we're doing more with arms than hanging lights. When we're hanging light banks or getting a flash head with a snoot on it well into a set, we need a good boom.

If you don't have a boom, you need one.

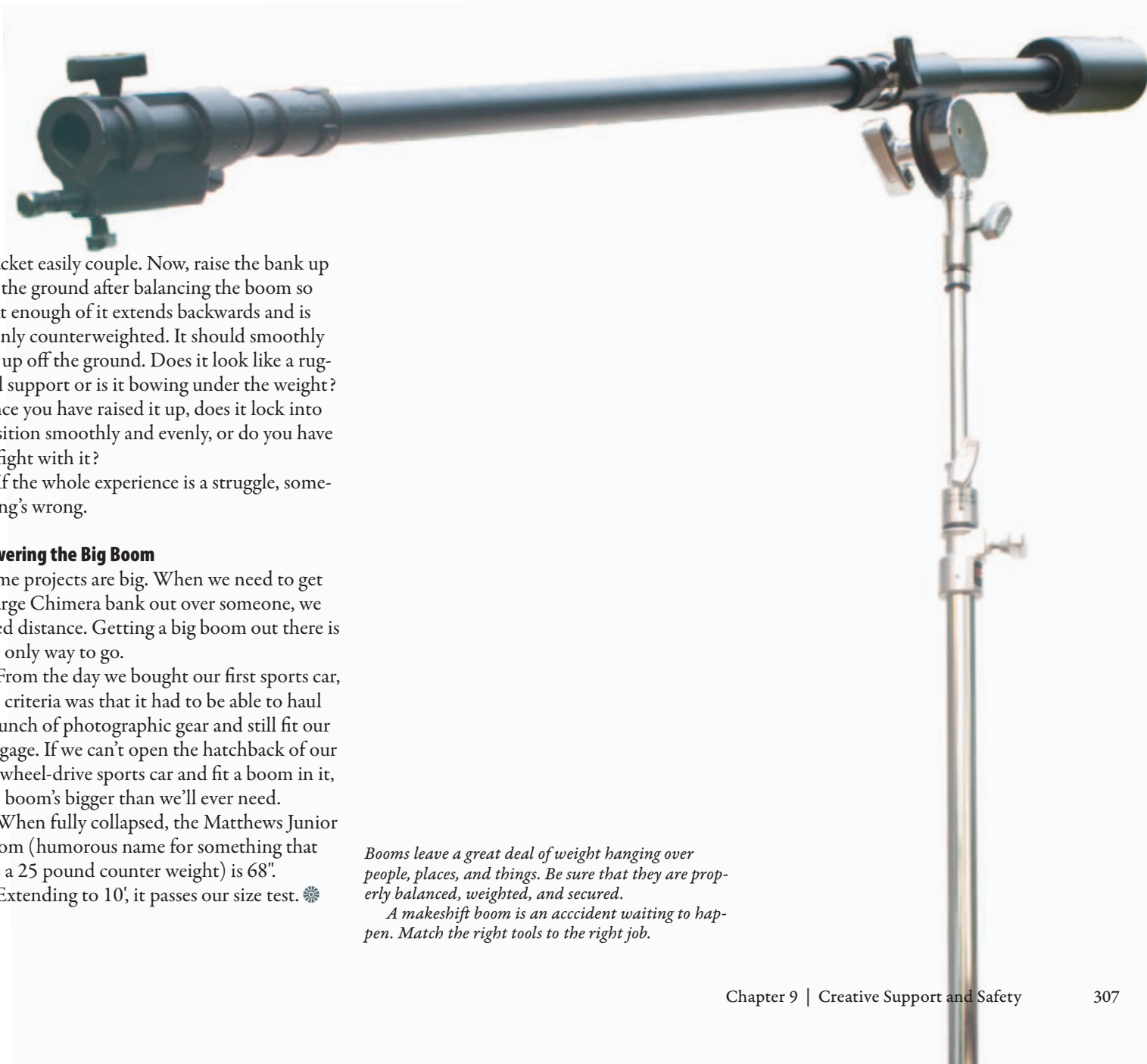
Look for something that extends at least six feet and weighs ten to twelve pounds. It has to be super durable.

At least a foot of the boom is going to extend in the opposite direction of the lighting instrument to handle the always important counterweight.

We have seen so many booms fail over time. The locking mechanism at the point where we adjust the angle of the boom is usually the place that cannot take the stress.

Passing the Test

Try out a boom at the camera store. Prepare to hang something substantial on one end of the boom. Put something like a flash head in a light bank on the ground. Point the boom downward and adjust the head's bracket so that the receiving end of the boom and the



bracket easily couple. Now, raise the bank up off the ground after balancing the boom so that enough of it extends backwards and is evenly counterweighted. It should smoothly lift up off the ground. Does it look like a rugged support or is it bowing under the weight? Once you have raised it up, does it lock into position smoothly and evenly, or do you have to fight with it?

If the whole experience is a struggle, something's wrong.

Lowering the Big Boom

Some projects are big. When we need to get a large Chimera bank out over someone, we need distance. Getting a big boom out there is the only way to go.

From the day we bought our first sports car, the criteria was that it had to be able to haul a bunch of photographic gear and still fit our luggage. If we can't open the hatchback of our all-wheel-drive sports car and fit a boom in it, the boom's bigger than we'll ever need.

When fully collapsed, the Matthews Junior Boom (humorous name for something that has a 25 pound counter weight) is 68".

Extending to 10', it passes our size test. 🌸

Booms leave a great deal of weight hanging over people, places, and things. Be sure that they are properly balanced, weighted, and secured.

A makeshift boom is an accident waiting to happen. Match the right tools to the right job.

Weights and Bags

Safety is always on our minds when it comes to support systems. Not only is good counterbalancing important, but in outdoor setups, you need to overcome the forces of wind. You can't have equipment blowing over and breaking, or worse, hurting someone.

You can't completely overcome some natural events, but you can properly set up and weight equipment to withstand some strong breezes. We always have our weather eyes open for shoot dates. Checking the hour-by-hour forecast for our specific location

provides information on wind direction and speed. We're ones to play it safe.

Erecting large diffusion frames for extended periods of time requires adjustment as the sun moves. These landlocked sailboats get to be in the neighborhood of 8' x 8'. Their diffusion screens raise up to around eight to twelve feet off the ground. They can easily topple over if not weighted extensively. It's the classic tale of man versus nature. When the winds are strong, man normally loses.

Smart Weights

There is no compromising when it comes to safety. We have seen photographers attempt to go down the home-made route with weights. Some are under the im-

pression that you can save up your gallon milk jugs, bring them to the location, and fill them with water there, attaching them to light stands with bent coat hangers. That misguided solution provides around four pounds to secure what could easily become over a thousand dollars of equipment.

How Heavy?

We bring with us weights that start at five pounds and get up to seven times that.

Securing a diffusion frame and the two stands that support it can require at least one hundred pounds with light breezes. This depends on the wind's direction and the frame's size, plus how it's positioned.

Boa Bags

Matthews has a cool little set of weights that they call "Boa Bags" (hanging above). They're available in 5, 10, and 15 pounds. These bags



These bags are great for the traveling photographer. They come empty and you fill them, on site.

are filled with steel shot and can be ordered with stainless steel filling, instead. Half of the weight is on either side of the bag and the center section has a soft gripping material that won't mar a surface, but provides a bit of tooth so that the weight is less likely to slip off whatever you have hung it on.

We wrap these around the ends of smaller booms and arms. They also hang off small stands. We try to take care to evenly distribute weight. Smaller bags are at higher places with the big weights at the base. This keeps the setup from becoming top-heavy.

Big Bags

Sand bags are available with as much as fifty pounds of weight. We find that much weight to be a little heavy for some of our people to transport. Watching out for people's health is always on our minds.

What's in the bag is important. Bags can get moist when you're caught striking a set and it starts to rain. All the Matthews sand bags are filled with sanitized sand to prevent algae from forming. Most of them are made with a water-resistant Cordura, but

we have water-repellent weights, too.

The big bags have good strong straps on them, so that they can hang firmly off supports.

The Empty Bag

When traveling by air, it doesn't make sense to ship twenty or thirty pounds of weights.

There's a great solution. Matthews has Fly-A-Way bags and Matthbags that weigh a quarter- to a half-pound, respectively. Once you get to the location, fill zip-lock bags with whatever, toss it in the bag, and close up the Velcro or double zippers. 🌻



Safety is your responsibility. Secure all support systems as you set up. Leave nothing open to fall on others. Protect people and property at all times.

Headers and Drop Downs

Did you ever feel like that stand you used to love was just too small for your needs? How about the need to mount more than one light on a single stand? Does it make sense to erect two or three stands, side-by-side?

Well, you are not only 100% correct about all the above, but we have been there and thought that, too.



Others think that way, as well, because all those support products already exist.

We try to travel as light as possible. Time wasted transporting gear is money-making time lost. Once on location, the less square footage of floor space that we consume, the better it is for traffic to navigate around us. This is especially true in public places.

Double and Triple Headers

To flood an area with a ton of light, attach a triple header (pictured above and to the left)

on a good sturdy light and mount up to five flash heads on the triple header (three on top and two on the bottom).

Check back to page 293 where we discuss Tough Rolux, to solidify the pool of light, reducing multiple shadows.

If you have five flash heads, driven by five power packs (or a combination of heads and monolights) you have a bunch of flash power. You also have quite an investment. Don't let this rig become top heavy and topple over. Be sure to weight it well.

Drop Downs

The world's tiniest boom has to be the Matthews Baby Drop Down. When you are shooting with a light bank on a boom and trying to get the bank to hang parallel to the ground, as the boom angles upward, the drop down straightens it out. A Cheater Adapter does this, too. This ability is important to some photographers when lighting with Lanterns and Pancakes. *(Please see pages 288 & 289, for more.)* 🌻



Magic Fingers



One of the coolest support accessories in the world is the Matthews Magic Finger. You almost want one for each of the serious stands and booms that you own.

It fully resolves the problem of what to do with a lighting instrument at the end of a support, when you need to tweak its position a few degrees over in this direction or a few degrees back in that direction.

The “finger” and its ball joint pivot from -15° to $+90^{\circ}$ and it rotates in its collar 360° . It’s a control with one locking handle.

Because so much is hanging on a finger, it’s machined from a solid piece of steel. At 2 pounds, it has to be one of the heaviest adapters in the business, but it’s designed to handle the tough tasks.

We’ve hung our largest light banks from these on long booms, and they have always held steady. 🌟

Grip Heads

There are a bunch of little support accessories that are standard equipment for many accomplished tabletop photographers. The people who shoot still-life photos need to light beautiful images. This requires a great deal of finesse to get the image just right.

These accessories are not limited to photographs where the subject doesn't move. Accomplished shooters of people have also borrowed what are central components of any self-respecting feature film's production gear.

At the center of the system is the Matthews 2-1/2" Grip Head, also known as a "Hollywood Head."

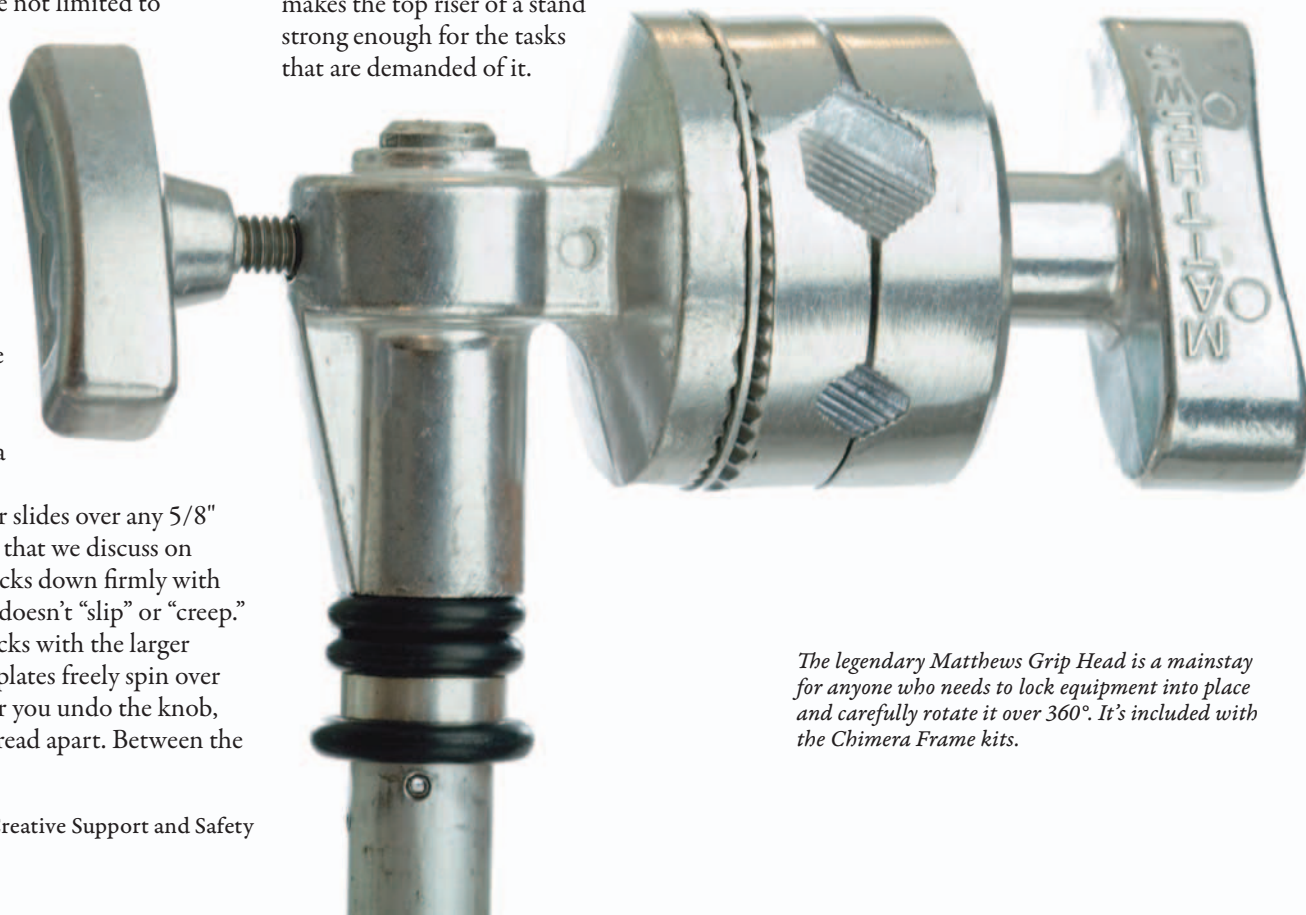
It fits over a stand or slides over any 5/8" shaft, such as the arms that we discuss on pages 306 & 307. It locks down firmly with the smaller knob, and doesn't "slip" or "creep."

The other side unlocks with the larger knob, so that the two plates freely spin over a full 360°. The further you undo the knob, the more the plates spread apart. Between the

plate is a 5/8" opening and a 3/8" opening. Whatever is locked into those openings can spin 360°.

Today, 5/8" studs are the standard of professional support equipment and the lighting instruments that go over them. It makes the top riser of a stand strong enough for the tasks that are demanded of it.

There was a time when 3/8" was considered an acceptable stud size by some for light stands. Now, it's a popular size for some smaller support equipment, like the MiniGrip Kit, which we look at on page 315. 🌸



The legendary Matthews Grip Head is a mainstay for anyone who needs to lock equipment into place and carefully rotate it over 360°. It's included with the Chimera Frame kits.

Mafers and Mathellinis

Another two sides of the Matthews clamping system are a series of jaw-like devices called Mafers (pronounced like “may for”) and Mathellinis.

Super Mafer Clamps

The underside of the Mafer fits over a light stand or various other support products. It has a special release pin that holds it in precise position

until the small knob can be used to lock it down firmly.

As the large knob is twisted, the jaw begins to close down on whatever you have put in its path. Both sides of it have protective pads, which also provide a very firm gripping action.

Besides chrome, Super Mafers Clamps come in nonreflective black. There are also Double Super Mafers for two attachments on one clamp.

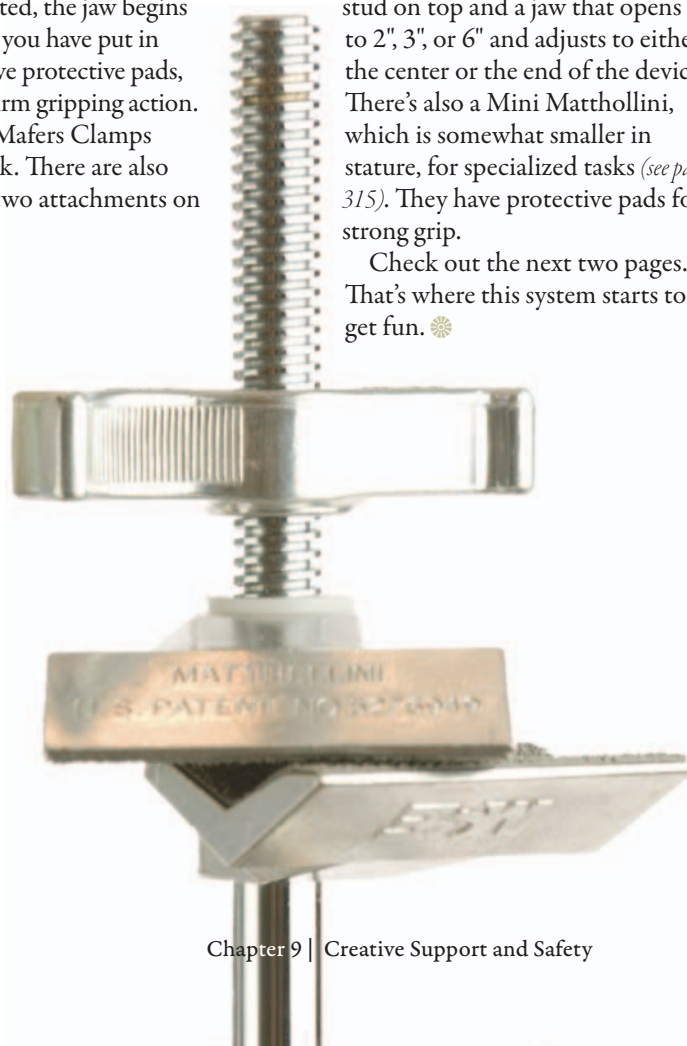


Mathellini Clamps

These industrial-strength clamps have a 5/8"

stud on top and a jaw that opens to 2", 3", or 6" and adjusts to either the center or the end of the device. There's also a Mini Matthollini, which is somewhat smaller in stature, for specialized tasks (*see page 315*). They have protective pads for a strong grip.

Check out the next two pages. That's where this system starts to get fun. 🌟



Flexible Arms and Knuckle Heads

Here's when the heads and clamps, on the previous two pages, are team players.

Hollywood Superflex Arm

The articulated arm is what makes the whole system super cool.

Each of the end segments have a serrated ball joint. The two middle segments have one on either side. Loosening any one of the three knobs permits two of the ball joints to move freely. Loosening all three knobs provides complete flexibility to all four segments.

The longer end segment terminates with something similar to a 5/8" stud on a lighting stand, but is slightly larger. It snaps into place on other Matthews gear. The shorter end has a

hollow 5/8" stud to accept accessories like the dots and fingers we discussed on page 267.

Working with System Components

This flex arm is strong. When locked down, it has quite a grip. Couple it to a Mafer on the long-ended segment side and lock the Mafer to a light stand. It'll support any of our flash heads without any drift. So

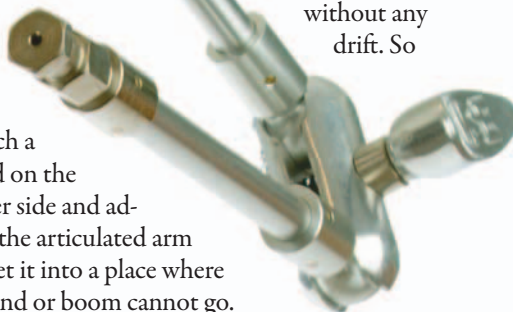
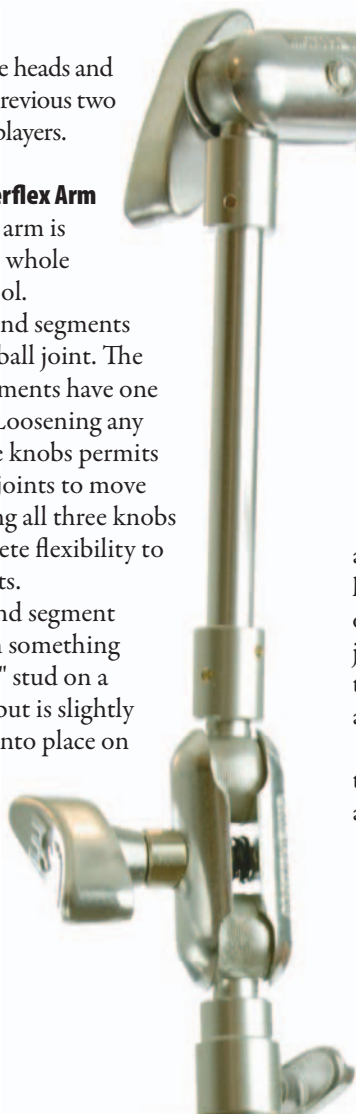
attach a head on the other side and adjust the articulated arm to get it into a place where a stand or boom cannot go.

Move the segments around to get reflectors or diffusers in front of a lighting instrument.

Knuckle Heads

When just a little bit of flexibility is needed, try a Matthews Knuckle Head. The ball joints and knob work the same way as the Matthews Hollywood Superflex Arm.

One side of it receives a 5/8" stud, so it fits right on top of a light stand or boom. The other end can firmly carry around fifteen pounds, so you can mount a flash head on it or insert any of the light modifiers that the Superflex Arm accepts. 🌟



MiniGrips



The Matthews MiniGrip Kit is another cool set of creative support tools in the system. The components of the kit, which comes in its own soft case, are similar to the Grip Heads and Mattheleins that we discussed on the previous two pages; they are just downsized as four MiniGrip Heads and two Mini Mattheleins, along with two 20" arms.

One of the MiniGrip Heads can fit over a light stand or boom. Because they spin freely over 360° and can angle infinitely on an arm, there are zillions of support combinations.

The Mini Mattheleins can clamp onto all sorts of things, but when used in combination with the Road Rags, and Grip Kits, which we discussed on pages 264 & 265, the possibilities seem endless.

One arm fits into a MiniGrip Head so that the two arms form a very flexible single unit with longer reach than a Hollywood Superflex Arm, just with fewer segments.

The whole kit is great for tabletop work or rigging things to the interiors of confined spaces, such as cars.

It's a great compliment to the wireless battery flash units that we discuss in Chapter 12, "Wireless Battery Flash," as well. 🌸

Clamps, Pigeons, Ties, etc.

Matthews Studio Equipment has a huge array of gear. Some of it is specific to the film or video industry. We're only discussing, in this volume, the goodies that are of greatest interest to photographers, we use ourselves, and hear other studios rave about.

Clamps

The Afflac Clamp mounts to the Superflex Arm or Knuckle Head, so that one of them has a very



powerful spring jaw at the end of it. This makes a perfect holding device for a reflector card, filter, or diffuser. Between the protective rubber pads, it opens wider than an inch.

When an even bigger jaw is needed the Gaffer Grip can open to as wide as 3.75" or it adjusts to less than 2" between the 12 rubber pads. It has two 5/8" studs for lighting instruments, so it's possible to clamp this grip to a sturdy surface and attach a flash head, HMI, or daylight fluorescent.

Pigeons

Matthews has some heavy-duty plates that hold lighting equipment on walls, set pieces, or attach to one of the



Apple Boxes that we discussed on pages 304 & 305.

Historically, these were known as "pigeons." These plates used to be attached to the top of set walls so that small lighting fixtures could be attached. Hence they rested on top of the set pieces, like birds.

The plates can be nailed in place or secured with all-purpose screws and a battery-operated drill. They come with 3", 6" or 12" studs, as well as a right angle.

These pigeons are also available with 5/8" female receivers.

Pins

Another great use of a Grip Head, Matthellini, or Mafer is to attach a heavy-duty pin. Then a lighting instrument can be added. These have a snap-in end. Most are straight, but there's a right angle, as well.

Ties

There are all sorts of little things that need to be secured on a set. Loose wires get into the shot. Knotting them up becomes a pain to undo when it's time to strike.

Toss a dozen Matth-Ties in one of your bags. Wrap one around some things. Push the rope's end through the side opening. Pull it at 90° toward the center and it will hang on tight.

Hard to Find a Place for a Light?

There are those shoots when everything is perfectly planned but something goes terribly wrong and suddenly you need to reach for your emergency kit.

Include a putty knife in your emergency response bag? Yep. It's not just any putty knife, though. The one you need has a 5/8" stud on it. This gadget can slip under a window sill, behind a baseboard heater (one that's off), under kitchen cabinetry, or any other place you can dream up. 🌟



Plate (a.k.a. "a pigeon")



Pin



Ties



Putty Knife

The Right Tripod

There are a bunch of tripods out there, and many of them are poor excuses for camera support. They're flimsy. The fittings have a limited lifespan. They're just not acceptable for professional use.

Some think that the tripod slows you down. These folks feel that they're more creative when they're free.

We, on the other hand, do this for a living. There's no excuse for coming back to the studio with photos that could have been good if it were not for the camera shake.

That's lost money that cannot be recovered. With that in mind, great tripods are some of our favorite pieces of photographic equipment. They not only provide a stable platform for capturing images, but during the testing phase of setup, they allow the camera to remain stationary as we make shot after shot and compare what we have.

It also forces us to frame up shots, as we have discussed and planned, to see whether what we're about to do is on the mark.

We have a few of tripods. Each one has a specific purpose.

Tripod + Head

Unlike the consumer tripods that are found in discount stores, professional tripods have two key elements: the lower tripod mechanics and the upper head, which should provide ample control over camera positioning.

If you don't have a great tripod, already, here's what you need to look for.

Feet

How you use your tripod indoors is different than what you do with it while in the natural elements of the outdoors. While shooting in a great indoor location, you

need feet that will be kind to the flooring. Outside, the feet need to help you dig into the surface for stability.

Some tripods accomplish the second task with adjustable feet.

Gentle rubber feet roll back to reveal spikes. You can vary each foot based on where you are shooting. The downside is that you're in trouble if you forget to cover the spike when you're shooting on someone's soft pine floor.

Another solution is a tripod with round pointed rubber feet that work somewhat universally in all situations.

Height Collapsed

How much space does your tripod need when collapsed? For a tripod that's studio-bound, that's not an issue. If you're on the go, on and off jets, in rental cars, attempting to keep your traveling space to a minimum, the more compact your tripod becomes, the happier you will be.



Comparing the lightweight Gitzo Mountaineer tripod (left) to the formidable Manfrotto video tripod (right) has to be kept in the context of the strengths and purposes of each.

Working Height

You want the best of both worlds with tripod height. Once it's open, you probably want all the working height that you can get. The taller you are, the more important this factor becomes. What's the height of your eye level when you're wearing cross-training shoes? It's probably around an inch more than your height without shoes.

The base of your camera to the viewfinder is somewhere around 4 or 5". A great head for a



tripod is around another 5 or 6". So from the tripod's highest point to the viewfinder is around 10 to 12".

Factor into that your eye being 6" less than your physical height and your tripod minimally needs to be 16 to 18" shorter than you, if you are to see through your viewfinder when you're standing up.

Someone who is 6' tall minimally needs a tripod height of 56". If you're 5' tall, 44" will do.

If you want a tripod that goes up so high that you have to stand on something to get the vantage point you need, factor that in.

How Low Can You Go?

Do you want to shoot close to the ground? Many tripods allow the legs to flare out at a pretty good distance. ☼



Weight and Location

It doesn't matter if you're a body-builder; when you're hauling a bunch of photographic gear all over creation, weight matters.

Construction

There are some great new materials that go into tripod construction. You can have durability and minimal weight.

Traditionally, tripods are built from aluminum tubing. Gitzo uses aluminum gravity casting rather than pressure methods for greater stability with a 30% lighter result for their Explorer line.

The most significant weight reduction comes from a radically different material, like carbon fibers. Gitzo's structure of six crossed-fiber layers provides excellent rigidity plus minimized vibration in their Mountaineer line of tripods.

Legs and Braces

Another weight factor is design. Can a tripod offer significant stability without braces on its legs? The more construction that goes into a tripod, the more weight is added.

Our Gitzo tripods do not have braces. The monster Manfrotto tripod that we have does have braces. Do we notice any stability issues?

We've noticed none. However the Manfrotto does grow to over 9'-3" with a Gitzo head, for a viewfinder height of more than nine and a half feet. So, the braces are obviously essential to its stable design.

Locking Legs

How a tripod's legs lock determine both its longevity and ease of opera-

tion. When you're shooting, it doesn't come down to the minute, shots are made or lost in a matter of seconds. You need to work fast.

A twist lock system is fast and can be strong. There should be no play between the locked parts.

The more sections a tripod's legs have, the longer it will take to raise completely.

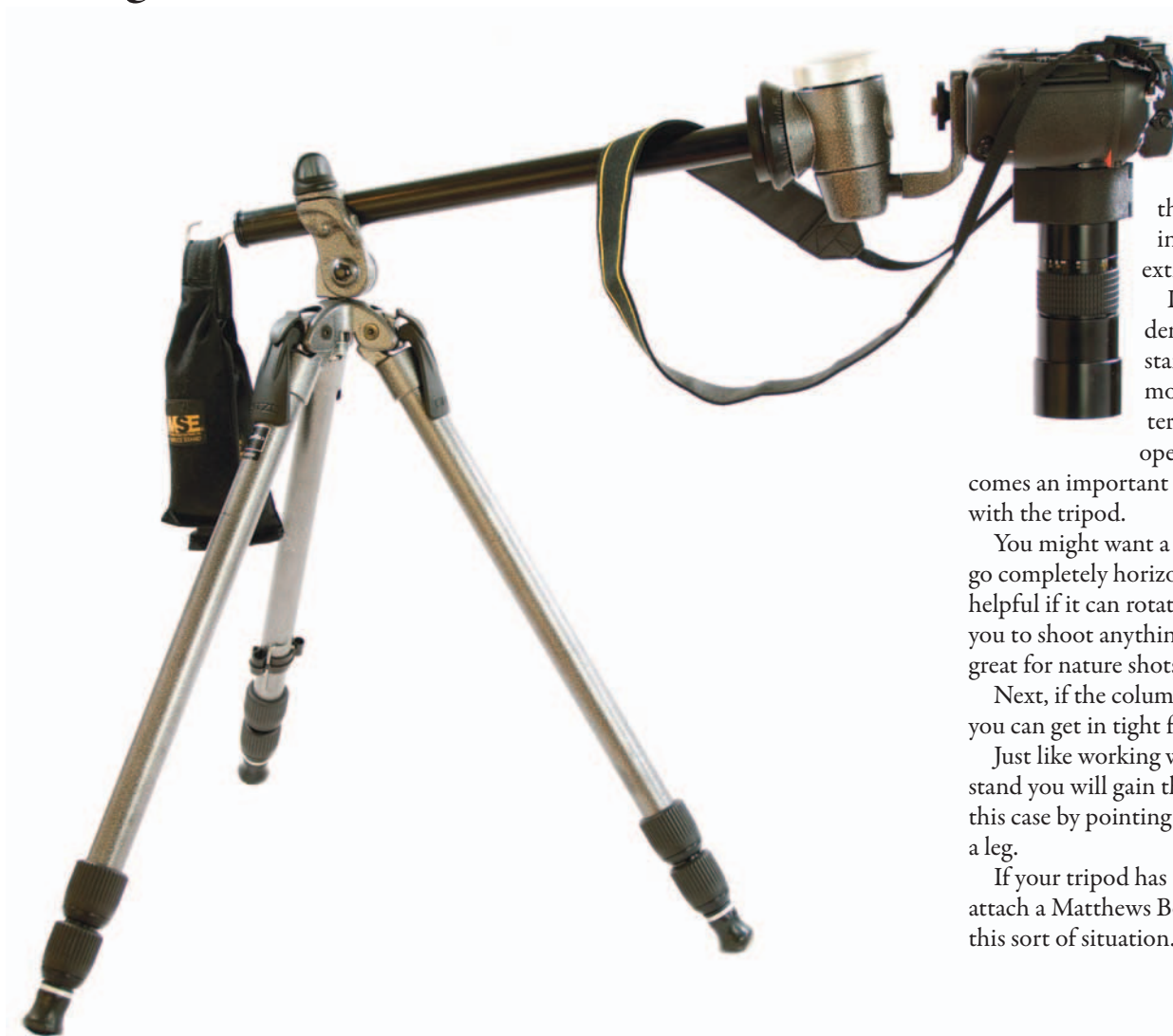
The Center Column

Some like a center column that cranks. It can provide a beautifully smooth operation. However, does it slow the process?

Does the center column get in the way for lowering the tripod close to the ground? If so, does the whole thing remove? 🌸



Tilting Column Wisdom



You may need the center column of your tripod to do more than move up and down, in order to gain a little extra height.

Legs that angle independently are a good place to start. They allow you to do more than just adapt to the terrain. When each leg fully operates on its own, it becomes an important part of weight-balancing with the tripod.

You might want a center column that can go completely horizontal. From there, it's helpful if it can rotate a full 360°. This allows you to shoot anything on the ground. It's great for nature shots.

Next, if the column angles up and down, you can get in tight for macro photos.

Just like working with a boom, on a light stand you will gain the greatest stability in this case by pointing the tilted column over a leg.

If your tripod has a hook on the column, attach a Matthews Boa Bag to the end of it, in this sort of situation. 🌸

The Quick Release Ball Head

Many professional photographers prefer a ball and socket head. They think that it's fast.

Quick Release

They even like a quick release head all the more. With a quick release, you attach a plate to the base of your camera. There's no attaching the camera to the tripod by carefully turning the 1/4-20 screw until it's tight. You slide the plate into place, and it locks there. When it's time to remove the camera from the tripod, you press a release switch, and it comes off.

If sometimes you know you have to have

the dependability of the tripod, but also have to leave

those three legs

behind and hand-hold, this is the answer for you.

Some photographers want the safety of a double quick release, so that the camera cannot be accidentally removed.

A quick release system has to provide a sense that the camera is firmly seated. If not, you think everything is in place, but as soon as you let the camera out of your firm grasp, it falls to the ground.

Ball Head Ergonomics

A great ball head has to be intuitive. Its calling card is that it offers a sense of freedom. There are fewer controls to mess with. One

knob gives you pan control. You have to reach a point where you can back off the knob so that there's just enough friction to prevent unwanted camera movement, but enough play to swing a little this way or that, over a 360° range.

The other knob that you need to get comfortable with is the ball's friction control. Not enough friction is like having no tripod at all; you risk camera shake. Too much friction prevents you from getting that perfectly composed shot.

A great ball head has balance that adjusts seemingly by the tiniest degree. 🌻



Off-Center Ball Head Control

In some ways, the ball head and the off-center ball head are very similar; in other ways they are very different.

The key similarity is that they provide a certain freedom. The controls are minimal and fast. Both encourage you to develop a relationship with the instrument to the point that you concentrate fully on the image-making. The adjustments are second nature.

Because the ball is set off to one side, if there is no panning to do, you set the friction of one knob just right and go to work.

Besides panning 360° horizontally, the offset ball flips 90° to go from a horizontal aspect ratio to a vertical one. Then, the camera is free to rotate 360° vertically, as well.

Photographers find a comfort zone with the ball to their right or to their left.

The goal is to allow the friction level to put camera

stability out of your mind. At that point, one concern is erased, and you begin to become a better photographer. 🌸

Besides rotating 360°, an off-center ball head angles the camera over a 90° range. In combination with the rotation, a photographer can adjust the camera to the left or right. You can additionally switch the camera to the center and use the control to tilt up and down. Because the ball is so flexible it rapidly adapts to whatever you need.





Daylight Fluorescent

Some photographers are deeply involved in a love affair with flash. Others are faithfully enamored with continuous light. The constant light sources are true what-you-see-is-what-you-get illumination. They make their suitors feel as if they are working with something akin to natural light. There's something to be said for that comfort level.

Photographers once considered fluorescent to be the mutts of lighting. Between cool white and warm white and whatever other fluorescent color temperature there may be, it was an on-film disaster.

Today, daylight fluorescent is a new darling of the image-making industry.

It's everywhere.

Daylight fluorescent is all over the broadcast news studios. The hot lights that once hung from their grids have been replaced with big banks of fluorescent tubes.

Even some feature film Directors of Photography (DP) have gotten into the craze.

The photographer need not feel left out of the trend. Westcott pioneered this method for the still shooter. Their Spiderlite has five 5,500 K lamps that need no color correction. They white-balance perfectly to daylight. To light a set with them indoors is to have only minor concerns for the exterior light's color temperature.

It's a cost-effective solution for getting started, too, especially in tabletop photography. 🌞

Bright Lights, Low Wattage

If you are looking for a low-cost means of getting into tabletop photographic lighting, you've found it.

We don't advocate shooting without an incident light meter, but if you have a camera with a great through-the-lens metering system, as we discussed back on pages 90 & 91, you might be able to pull it off, until you're able to invest in a great meter.

Great Quality of Light

We see no defects in the quality of illumination of daylight fluorescent, in a soft box. If anything, when we're shooting with it, we feel as if we are cheating. It's as easy as it claims to be. The results are world-class.

The Downside

It's not an all-things-to-all-people lighting resource. Much like hot lights, the output's not powerful enough for groups of people. We use a 135-watt Spiderlite. For better people-shooting possibilities, get the 226-watt TD5. There's practically a full f-stop advantage with the extra output for any subject.

Simple Execution

Because still life is pretty much a depth of field-driven photography, you may be able to forget the shutter speed (as long as it's not

so slow that it creates "noise") and base your exposure on the needed f-stop.

Try switching to aperture priority, as we explored on page 85, and let the shutter speed be determined by the camera. Again, this depends on an even illumination. High-key or low-key images could fool the meter, with some cameras.

The image to the right is an excellent example of how, with only 135 watts of energy consumption, we are able to create all the illumination we need to do fantastic still life.

Like the photo on the previous page, it benefits from a white surface's reflections. 🌻



With the exception of the final image in this chapter, all were done with one Westcott Medium Soft Box, and one daylight fluorescent Spiderlite TD5.

Tech Specs

Photographer

Brian Stoppee

Stylist

Tracey Lee

Illustrator/Art Director

Janet Stoppee

Camera

Nikon D2x • ISO: 100 • Shutter Speed: 1/50
Manual Mode

Lens

Micro-Nikkor 200mm f/4 IF
35mm Focal Length: 300mm @ f/5.6

Lighting

1 - Westcott Spiderlite 135 watt TD5
1 - Westcott 36" x 48" Silver Soft Box
1 - Westcott 30" Illuminator - White Diffusive/Reflective Panel

Light Meter

Gossen Starlite

Support

1 - Gitzo Explorer
1 - Gitzo Off Center Ball Head
1 - Matthews Preemie Baby Stand

Software

Adobe Bridge, Camera Raw, and Photoshop
Corel Painter



The Funny-Shaped Lamps

In 1896 Thomas Edison invented the fluorescent light and eleven years later received a patent for it. He never put his invention into commercial production.

Fluorescent lamps are filled with a gas containing low-pressure mercury vapor and argon. They have a far greater lifespan than tungsten, consuming less energy than their hot-light

competitors. A fluorescent lamp lasts ten to twenty times longer than incandescent lamps. It's energy efficiency, compared to tungsten, which typically con-

verts only 10% of its energy into visible light, whereas fluorescent creates useful light from around 22% of its energy.

A 15-watt fluorescent produces about as much light as a 60-watt incandescent.

The downside to fluorescent is that mercury vapor. After a lamp breaks and is cleaned up, the environment in which it was broken can still poison a child.

The invention of compact fluorescent light (CFL) has changed how the world consumes electricity. Leaving behind the blue-green or pink casts that gave fluorescent a bad reputation has been turned around by these household lamps that burn at a color temperature of 2,700-3,000 K, which is comparable to an incandescent bulb.

What works at home does not necessarily fly in the image-making workplace.

In the bad old days of fluorescent, when the tubes started up, they'd have a flicker to them. Flickering lights may not be perceivable to human vision, but it is to video. The fluorescent lamps used there are flicker-free.

Image-makers also demand 5,500 K, not a variable product or the color temperature that's popular for your home.

The lamps in the Westcott Spiderlites are daylight, on the money.

Though the Spiderlite lamps should have a long life and the lighting instrument has its own cover, the CFL might break. If it does, dispose of it properly, and replace it with a genuine professional-quality lamp for an even, color-correct light.

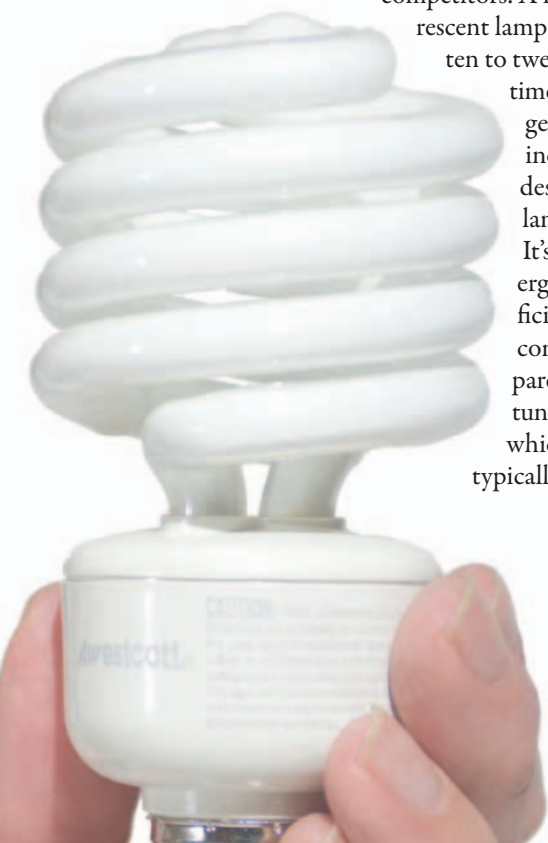
Frequently turning a CFL on and off shortens its lifespan.

A Westcott Spiderlite is designed to be used in conjunction with their soft box products. The light it produces has a very broad spread, making it perfect for that application. So, if its efficiency were to be compared to something like a flash head, that would be difficult to do.

However, the tech specs to the right tell the story best. We tripod-mounted the macro lens that was giving us a 35mm film equivalent of a 300mm. To get the depth of field look we were after, $f/5.6$ was perfect. This gave us a shutter speed of $1/50$ of a second.

In the previous section, we said that the Spiderlite, with fluorescent lamps, was not ideal for people photography. To clarify that, though, our light-source-to-subject distance is quite close here, at $f/4.0$, our shutter speed would be $1/100$, and at $f/2.8$, we'd have a shutter speed of $1/200$ of a second.

They're within the range for some reliable people photography conditions. 🌞



Tech Specs

Photographer

Brian Stoppee

Stylist

Tracey Lee

Illustrator/Art Director

Janet Stoppee

Camera

Nikon D2x - ISO: 100 • Shutter Speed: 1/50
Manual Mode

Lens

Micro-Nikkor 200mm f/4 IF
35mm Focal Length: 300mm @ f/5.6

Lighting

1 - Westcott Spiderlite 135 watt TD5
1 - Westcott 36" x 48" Silver Soft Box
1 - Westcott 30" Illuminator - White Diffusive/Reflective Panel

Light Meter

Gossen Starlite

Support

1 - Gitzo Explorer
1 - Gitzo Off Center Ball Head
1 - Matthews Premie Baby Stand

Software

Adobe Bridge, Camera Raw, and Photoshop
Corel Painter



The Total System

Part of what makes the Westcott Spiderlite a dream to use is the simplicity.

Another plus is that there's a big system that surrounds it. Though the Spiderlite is new, Westcott goes back to the late 1920s. It's not like one of these new lighting

companies that are here today and gone tomorrow, having products made out in who knows where.

Fluorescent does not dim. You control the light output of a Spiderlite TD5 with the three switches on the back. One is for the center 27-watt lamp, and the other two switches are for the top and bottom and left and right lamps of the same wattage each.

The TD5's metal case has the four rod insertion points for a soft box, saving the expense of a speed ring. Its face is a reflective surface for maximum light efficiency. Use the handle to rotate the instrument from a vertical position to a horizontal one when a rectangular soft box is attached to it.

Novatron users will feel right at home with the tilter bracket. The base attaches to a light stand and the opposite side has room for an umbrella's rod to be inserted. We love the handle on the bracket because it not only tilts the TD5 back and forth, but also lets you pull the handle away from the bracket. You can reposition the handle without affecting it being locked in position. This is great for accessing the tilter

if it becomes blocked while a light modifier is in use.

Keep the compact fluorescent lamps burning for a long time, without breakage. Get the protective cover that straps to the back.

Please see the next two-page section for how it all comes together as a soft box. 🌀



Use the three switches on the back of the Spiderlite to vary the intensity of the light output.

Tech Specs

Photographer

Brian Stoppee

Stylist

Tracey Lee

Illustrator/Art Director

Janet Stoppee

Camera

Nikon D2x - ISO: 100 • Shutter Speed: 1/50
Manual Mode

Lens

Micro-Nikkor 200mm f/4 IF
35mm Focal Length: 300mm @ f/5.6

Lighting

1 - Westcott Spiderlite 135 watt TD5
1 - Westcott 36" x 48" Silver Soft Box
1 - Westcott 30" Illuminator - White Diffusive/Reflective Panel

Light Meter

Gossen Starlite

Support

1 - Gitzo Explorer
1 - Gitzo Off Center Ball Head
1 - Matthews Premie Baby Stand

Software

Adobe Bridge, Camera Raw, and Photoshop
Corel Painter



Soft Box Simplicity

As you can see from the illustration to the right, it's easy to assemble a Westcott Soft Box, anywhere, in no time.

Here, we wanted to photograph shrimp, in snow, while the white stuff was still falling. In such conditions, the light is even but not dramatic. We needed a little kick.

Notice the reflection of the soft box on the rim of the metallic bowl and the highlights on the upper right side of the shrimp. The soft box built contrast and dimension. It makes the image snap.

It's best to assemble the Westcott Soft Box while the Spiderlite TD5 is still wearing its protective cover, or remove the lamps and put them somewhere safe until you have built the soft box's frame. Put the rods into the box's sleeves first. Then attach the rods to the TD5. It works well if the box is facing down, on a clean floor surface, without the diffusion panels installed yet.

The rods of the Westcott Soft Box are quite flexible. We assembled it indoors, squeezed it through a doorway and placed it on a stand outside. We don't advocate the use of lighting equipment outside while precipitation is falling. While we were shooting, the snow was tapering off, and the Westcott is water-resistant enough for the minor amount of snow to have no effect on the soft box. ❀



Filmmakers take their daylight fluorescent lighting outdoors when they need some snap from the illumination, so we did the same.



Tech Specs

Photographer

Brian Stoppee

Stylist

Tracey Lee

Illustrator

Janet Stoppee

Camera

Nikon D2x - ISO: 100 • Shutter Speed: $\frac{1}{500}$
Manual Mode

Lens

Micro-Nikkor 200mm f/4 IF
35mm Focal Length: 300mm @ f/4.0

Lighting

1 - Westcott Spiderlite 135 watt TD5
1 - Westcott 36" x 48" Silver Soft Box

Light Meter

Gossen Starlite

Support

1 - Gitzo Explorer
1 - Gitzo Off Center Ball Head
1 - Matthews Premie Baby Stand

Software

Adobe Bridge, Camera Raw, and Photoshop
Corel Painter



Create Reflections: A Quick Starter

If you are just getting started with daylight fluorescent as your first experience with artificial light, this section is a quick primer for you.

Let's review how your light-source-to-subject distance affects the quality of the illumination. The closer you bring the light source to the subject, the more the light wraps around it.

A specular highlight is a mirrored reflection of the light source. In the image to the right, we see a reflection of the soft box on the neck of the wine bottle. We can tell from the size of the specular highlight that the 36" x 48" light source was just a few feet away.

We also see both the base of upside-down stemware as well as the reflection of the glass in the bottle.

If the light source were further away, the highlight would be smaller. If the soft box were just about on top of the thing, the highlight would be so large that it would be distracting and somewhat unnatural in appearance.

If our light source were larger, our specular highlight would be larger, too. However, the light would have had to fill a larger area, so it would have been less efficient. Our exposure would have been different.

We could change our exposure in three ways, if the light source were larger:

1. Increase the amount of time the shutter remains open. If the shutter remains open too long, there could be noise on the image.

2. Increase the sensitivity from ISO 100 to something higher. Again, this is a known culprit of unwanted noise, if the sensitivity goes too high.

3. Open the aperture wider. The result would be a more shallow depth of field.

Each of these solutions has a consequence.

A fourth answer is to bring the light source closer to the subject. That would alter the look of the highlight and change how the dark bottle separates from the background. As shot, it has its own mystique. There's just an adequate amount of visual information in the photo to convey that it's a wine bottle.

Another possible response would be to get more light into the box. There is no negative effect on increasing the light source's power output (except that you have to buy it).

If you were working in a darkened studio, you could do a multiple exposure (providing that you do not bump the camera).

Put together a setup of your own. Develop a concept. Explore what you can do with the light. Examine each possibility. Evaluate the results. In Adobe Bridge, label your top five favorites. Show only the favorites. Ask yourself how the results could be better. 🌟

Tech Specs

Photographer

Brian Stoppee

Stylist

Tracey Lee

Art Director

Janet Stoppee

Camera

Nikon D2x - ISO: 100 • Shutter Speed: 1/50
Manual Mode

Lens

Micro-Nikkor 200mm f/4 IF
35mm Focal Length: 300mm @ f/5.6

Lighting

1 - Westcott Spiderlite 135 watt TD5
1 - Westcott 36" x 48" Silver Soft Box
1 - Westcott 30" Illuminator - White Diffusive/Reflective Panel

Light Meter

Gossen Starlite

Support

1 - Gitzo Explorer
1 - Gitzo Off Center Ball Head
1 - Matthews Preemie Baby Stand

Software

Adobe Bridge, Camera Raw, and Photoshop



Create Moonlight

Once again, we had to be like the motion picture people and take our daylight fluorescent instruments outdoors.

Another big plus to fluorescent is that as it uses so little energy, there are not big power needs on location. Sometimes when feature films are at remote locales, the only power source is a few electrical generators.

The power needs of a Westcott Spiderlite is so minimal that a little portable generator could keep a few of them going for a while.

For this shot, we wanted to balance three light sources with three different color temperatures. Part of the challenge was to also balance the exposure of those three sources.

If the fire burned too hot, it would wash out. If too much incandescent illumination spilled from the interior, we would lose the look of moonlight.

Our daylight fluorescent source was as close as it could get and still fully illuminate the entire shooting area.

At a 28mm focal length (42mm for 35mm), we had a generous depth of field, but $f/8.0$ proved to be just enough. These settings gave us a shutter speed of $1/1.3$ of a second. That was already pushing the possibility of noise, so adjusting the sensitivity upward was not a viable option. We played with the intensity of the interior light and just stoked the fire.

This is a classic case of careful trial-and-error testing: knocking off a bracket this way, and another bracket that way, and getting it onto the computer screen as quickly as possible for cautious examination.

When you examine a shot like this, check out the tiny details. Ask yourself things like, “Is the exposure time long enough for the candle flames to appear?” “Does the red wine in the goblets separate enough from the background and have sufficient illumination for the wine to not appear black?”

For a shot like this, the tiny details show that you have the technical expertise. Celebrate a great concept with equal technique. 🌞



Balancing exposure and color temperature from multiple light sources is a juggling act. Excellent planning and sweating the details makes the shot.

Tech Specs

Photographer

Brian Stoppee

Stylist

Tracey Lee

Illustrator

Janet Stoppee

Camera

Nikon D2x - ISO: 100 • Shutter Speed: $1/1.3$
Manual Mode

Lens

AF-S Zoom-Nikkor 28-70mm $f/2.8$ IF-ED @ 28mm
35mm Focal Length: 42mm @ $f/8.0$

Lighting

1 - Westcott Spiderlite 135 watt TD5
1 - Westcott 36" x 48" Silver Soft Box
1 - Westcott 54" x 72" Silver Soft Box w/Tungsten

Light Meter

Gossen Starlite

Support

1 - Gitzo Explorer
1 - Gitzo Off Center Ball Head
1 - Matthews Baby Jr. Double Riser Stand
1 - Matthews Baby Jr. Triple Riser Stand
1 - Matthews Boa Bag - 15lb.
1 - Matthews 20lb. Saddle Bag

Software

Adobe Bridge, Camera Raw, and Photoshop
Corel Painter







Chapter 11

HMI

Since the early 1970s, HMI has captured the hearts and minds of Directors of Photography (DP) of film and television. Now, they are the lighting instruments of choice for many major motion picture productions.

For quite a while, HMI was too big and too expensive for photographers.

Today, some HMI instruments are so small that you need only one hand to carry a couple of light heads. Some are even small enough to mount on top of a video camera.

HMI is an abbreviation of Hydrargyrum medium-arc iodide. Hydrargyrum is an archaic word for mercury (Hg), so the HMI is more accurately a mercury-halide.

The light from an HMI has a very special look to it. To the trained eye, it just says “Hollywood.”

Though surely not available anytime soon from your big box store discounter, the HMI look is growing in popularity. These lights are used in many museum exhibits, in trade show booths, and even in some retail establishments.

Appearing to be a continuous light source, many enjoy their what-you-see-is-what-you-get qualities.

They emit a fabulous daylight color temperature of around 5,500 K. For that reason, big HMIs are often used in outdoor situations.

Production company jargon speaks of the power of an HMI in terms of 1,000 watts of power (kilowatts). An HMI with a big 10,000 watts is known as a “10K HMI” to differentiate it from a “10K,” which is an incandescent fixture, or as it’s sometimes called, a “tener.” 🌸

Why HMI?

An HMI lighting instrument is a marriage of two inseparable components: a light head and a ballast. Together, they control the HMI lamp that's in the light head. As unique as the HMI lamp may be, it bears a minor resemblance to a quartz halogen lamp. However, any similarities are only glass deep.

Unlike an incandescent lamp, which heats a tungsten-based filament, the HMI creates an electrical arc between two electrodes. The arc excites the pressurized mercury vapor and a highly efficient light output is created.

In North America, where we have 60 hertz, 120 volt AC power, the HMI lamp cycles on and off 120 times per second, rather than causing a filament to glow continuously, as do incandescent lamps.

This cycling on and off is called “flicker.” The challenge for a great HMI unit is to

create a flicker-free environment, so that the flicker does not skip a beat during the shooting of a film or with a fast shutter speed.

Generally, there are three types of HMI light heads:

- An optical spot/flood instrument is much like a camera's lens. It has a front element optic and an internal one. As the internal mechanics are adjusted, the beam varies.

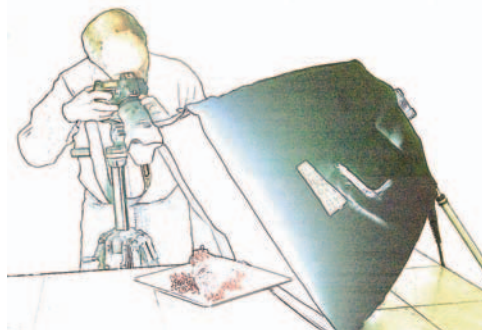
- A “PAR” is a popular instrument for HMIs. It's an abbreviation for Parabolic Aluminized Reflector. It generally produces a light with a hard edge.

- The third HMI instrumentation is something of a stripped-down version of the PAR. Sometimes called a “soft light,” it's PAR without the reflector, similar to a bare tube head for studio flash. The soft light is great for soft banks, as we used in the shot to the right. 🌸



The tiny HMI lamps, to the left, produce big light, due to the optical design of the light units.

To the right, we used an HMI light head, in a soft bank. It's an easy to manage light source. The HMI has plenty of power output for photographing still life.



Tech Specs

Photographer

Brian Stoppee

Stylist

Tracey Lee

Illustrator

Janet Stoppee

Camera

Nikon D2x - ISO: 100 • Shutter Speed: 1/200
Manual Mode

Lens

AF-S Zoom-Nikkor 28-70mm f/2.8 IF-ED @ 70mm
35mm Focal Length: 105mm @ f/7.6

Light Source

1 - DedoPAR Light Head with Direct/Soft Attachment
1 - Dedolight HMI Electronic Ballast
1 - Dedolight Soft Bank

Light Meter

Gossen Starlite

Support

1 - Manfrotto Tripod with Quick Release Head
1 - Matthews Preemie Baby Stand

Software

Adobe Bridge, Camera Raw, and Photoshop
Corel Painter



Controlling the Ballast

It's very easy to get along with a ballast. It is the HMI's control panel.

Start Up

After securing the light head to a support, connect it to the ballast using the special cabling and power up the ballast. If everything is in correct working order, the “ready” light comes on. Next, press the start button on the ballast or the light head, and within a matter of seconds, you'll see a gorgeous light appear. After the lamp has been ignited, the control panel indicates that with an illuminated “lamp” light.

An HMI lamp has around a 700-hour lifespan. Normal usage is three hours on and one hour off.

Intensity Control

Though the Academy Award-winning Dedolight labels their units at 400 watts, the control panel reveals their modesty. The boost position pumps the unit



up to 575 watts. A dim position allows variable control over a 200- to 400-watt range.

5,500 K Light

Unlike dimming the light in your dining room, where the space not only becomes darker but the light takes up a warmer position on the Kelvin scale, the Dedolight holds its temperature at any intensity. 🌸



It's obvious in the image to the right that on a pleasant day in partial shade, we added some lighting dimension with an HMI housed in an eight-sided soft bank. The diffused speculars on the tomatoes give the red spheres shape, with a very natural feeling.

Tech Specs

Photographer

Brian Stoppee

Stylist

Tracey Lee

Illustrator

Janet Stoppee

Camera

Nikon D2x - ISO: 100 • Shutter Speed: 1/200
Manual Mode

Lens

AF-S Zoom-Nikkor 28-70mm f/2.8 IF-ED @ 70mm
35mm Focal Length: 105mm @ f/7.1

Lighting

- 1 - DedoPAR Light Head with Direct/Soft Attachment
- 1 - Dedolight HMI Electronic Ballast
- 1 - Dedolight Octadome

Light Meter

Gossen Starlite

Support

- 1 - Manfrotto Tripod with Quick Release Head
- 1 - Matthews Premie Baby Stand
- 1 - Matthews Boa Bag - 15lbs.

Software

Adobe Bridge, Camera Raw, and Photoshop
Corel Painter



The PAR

Professional photographers who have been working with studio flash equipment for years can relate to the PAR. The PAR is much like a flash head with its reflector, especially if the reflector detaches and the HMI light head becomes something like a bare tube head, just as its flash head relatives generally do.

For electronic news gathering (ENG) out in the field, a little PAR is often the standard equipment that's mounted on top of broadcast news cameras.



The Parabolic Reflector and Light Output

The DedoPAR Daylight that we're familiar with works with the ballast we discussed on the previous two pages. So it's a 400-watt light head that bumps up to 575 watts. This is a little more than many HMIs offer, for a PAR. However, usable illumination comes down to good lighting equipment design and engineering. This makes it difficult to compare a PAR from brand "A" with brand "B."

As with any lighting instrument, the incident light meter tells the real story.

As with most PARs, the DedoPAR is often used without any optics over its reflector. That's when its light output is the most efficient. The use of interchangeable lenses allows you to diffuse the beam. (See photos on page 351.)

Going Bare

One of the things we enjoy about the DedoPAR is its adaptability. We can remove the front reflector section and replace it with the Direct/Soft attachment. Chimera and West-



cott have speed rings for this. So it goes right into the same soft banks that we use for all our other photographic efforts. (Dedolight also has its own line of soft banks.) The attachment comes with a quartz glass tube. This filters UV, but it also serves as a safety component. If the protective glass filter tube is damaged, the light head shuts down. ☀



The DedoPAR with the direct/soft attachment in a soft bank is excellent for tabletop photography. 1/250 of a second stops the champagne bubbles when the ballast is set at the full 575 watts. Nonmotion still life permits slower shutter speeds and greater depth of field, if desired.

Tech Specs

Photographer

Brian Stoppee

Stylist

Tracey Lee

Illustrator

Janet Stoppee

Camera

Nikon D2x - ISO: 100 • Shutter Speed: 1/50
Manual Mode

Lens

AF Zoom-Nikkor 80-400mm f/4.5-5.6D ED @ 135mm
35mm Focal Length: 202mm @ f/5.0

Lighting

1 - DedoPAR Light Head with Direct/Soft Attachment
1 - Dedolight HMI Electronic Ballast
1 - Dedolight Soft Bank

Light Meter

Gossen Starlite

Support

1 - Manfrotto Tripod with Quick Release Head
1 - Matthews Premie Baby Stand

Software

Adobe Bridge, Camera Raw, and Photoshop
Corel Painter



That Hollywood Look

You cannot successfully define the “Hollywood look” when it comes to lighting, anymore than you can define the culinary expertise of all five-star restaurants. Every great film’s Director of Photography (DP) crafts the look of the lighting in concert with the director’s vision.

The greatest feature films have a look to them that can be distilled down to the term “artfully crafted”.

There’s a visual economy to how they’re lit. Your attention is focused exactly where it should be. The audience has a sense of all that’s happening in the scene, but their eyes do not wander away from the central action.

With this in mind, we challenged ourselves with the image to the right. We have just one DedoPAR in a medium soft bank. Using a long telephoto lens, we are shooting from across the room. The light source is creating a specular highlight on the wine glasses, which could serve as a distraction.

By framing the shot tightly, we force the viewer to concentrate on the couple’s faces, but we have given ourselves an advantage by directing the models’ eyes to the wine glasses. The audience is unable to observe their eyes, a natural human inclination.

Please compare this to the same female model featured in this chapter’s divider spread

on pages 338 & 339. We are drawn to observe the joy in her eyes, which picks up on the richness of her hair.

The technology of image-making is a lifelong learning process. There is much to know, and it is ever-expanding. However, the creativity is not formulaic.

Just as an accomplished DP does not light two films the same way, don’t let yourself get caught in a photographic rut. Every face is different. Make every photograph a customized experience for your subject. Craft every image with a sharp mind.

The more you challenge yourself, the better you will become. 🌸



Luciene and Joe are lit with just one medium soft bank. A soft PAR, at 575 watts, is the only light source. A long telephoto lens compresses the image, letting us focus on the talent.

Tech Specs

Photographer

Brian Stoppee

Stylist

Tracey Lee

Illustrator

Janet Stoppee

Camera

Nikon D2x • ISO: 100 • Shutter Speed: 1/40
Aperture Priority

Lens

AF Zoom-Nikkor 80-400mm f/4.5-5.6D ED @ 175mm
35mm Focal Length: 262mm @ f/5.0

Lighting

1 - DedoPAR Light Head w/Direct/Soft Attachment
1 - Dedolight HMI Electronic Ballast
1 - Dedolight Soft Bank

Light Meter

Gossen Starlite

Support

1 - Manfrotto Tripod with Quick Release Head
1 - Matthews Preemie Baby Stand

Software

Adobe Bridge, Camera Raw, and Photoshop
Corel Painter

Talent

Luciene Pereira
Joe Reyes



The Optical Spot/Flood

Though experienced professional photographers can find familiarity in the PAR, the optical spot/flood is a new experience for many. It's often this delightful new lighting experience that coerces photographers to add HMIs to their arsenal, even if they have an extensive complement of battery and AC power flash units.

Some HMI manufacturers copy an instrument that has been for decades the lighting backbone of stages from Broadway to the local middle school auditorium. The fresnel (pronounced like “fray nell” by some and “fra nell” by others) gets its name from its unique step lens that's on its front end. It's a smaller version of the lens we see on light houses.

Though this may work well for theatrical usage, in still photography, where you are able to carefully examine every aspect of the image for as long as you like, the hot spots that some fresnels create is not acceptable to many photographers.

Dedo Weigert won Oscar and Emmy

awards for his design of the Dedolight optical lighting instrument. It not only trades the fresnel lens for its own front end optic, but adds a second lens within the light head for a more even, manageable, efficient illumination.

For the image to the right, we created a natural lighting situation by placing one Dedolight 400 outside a window and shot the light exactly as it was presented to us. We



The unique quality light from an optical instrument is obvious from what we see streaming through the window, with one spot outside.

Tech Specs

Photographer

Brian Stoppee

Stylist

Tracey Lee

Illustrator

Janet Stoppee

Camera

Nikon D2x - ISO: 100 • Shutter Speed: 1/30
Manual Mode

Lens

AF-S Zoom-Nikkor 28-70mm f/2.8 IF-ED @ 48mm
35mm Focal Length: 72mm @ f/2.8

Lighting

1 - Dedolight HMI Daylight Head
1 - Dedolight HMI Electronic Ballast
1 - Dedolight Barn Door

Light Meter

Gossen Starlite

Support

1 - Manfrotto Tripod with Quick Release Head
1 - Dedolight Stand

Software

Adobe Bridge, Camera Raw, and Photoshop
Corel Painter



lowered the angle of illumination to gain soft shadows, mimicking light later in the day. We chose not to filter the light warmer because of the effect on the yellow glass, and liquid seemed to harm the image more than help it.

In all our decades of lighting with flash and other means of illumination, we know of no other lighting instrument that can duplicate this look.

Focusing

Using a Dedolight 400 HMI light head couldn't be easier. Follow all the directions we provide about the ballast on page 342.

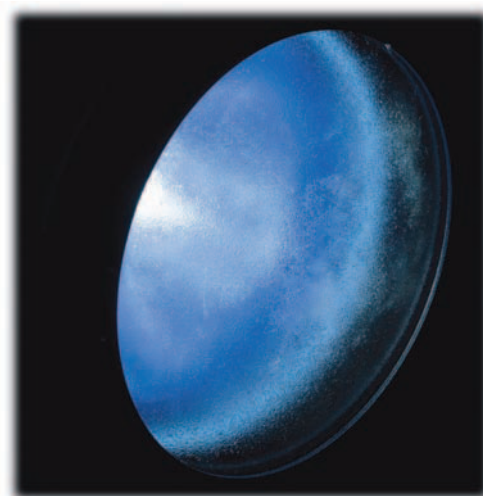


As you twist the focusing knob on the back of the Dedolight, a red indicator conveniently shows you the angle of the beam. This varies from a spot of 4.5° to a 50° flood. Internally, as you turn the knob, you are moving the lamp and an optical element toward the front of the light head. As the assembly meets the widest or most narrow beam the relationship between the lamp of the lens is further refined.

The ballast is your control panel.

Use the guide on the side of the light head as you twist the back knob back and forth. When it's cranked all the way to the rear, you have a spotlight of 4.5°, and when it's all the way up front, it's a flood of light with a 50° spread. None of these positions create hard edges, but the light source quickly drops off.

On page 138, we discussed the inverse square law. As we concentrate more light in one place, the intensity increases. The broader the beam, the more light it takes to fill the larger space. This relationship is evident as you focus this HMI light head.



When you use the light head in the spot position, you will have a far different meter reading than in the flood position.

This is where you also see the advantage of the Dedolight optical system over a fresnel design. Even when as wide as 46°, at 400 watts, the Dedolight has the intensity of some fresnels that are 1K and more.

Accessories

The Dedolight 400 HMI comes with a very thorough four-way barn door. Two of the individual doors expand or contract, as

needed. It slips right into the holders that are built into the front of the light head. A sliding latch securely locks it in place.

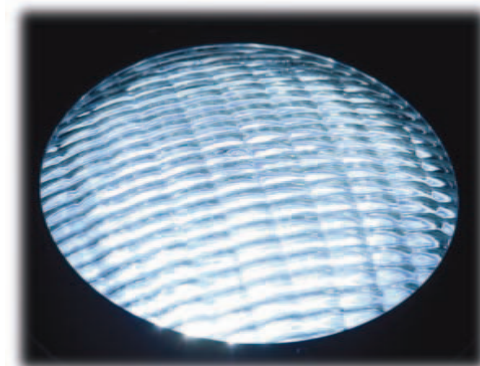
This works the same way that the projector attachment is secured.

The Dedolight also comes with diffusion screens that Dedo calls “scrim.”

200 Series

Dedo has a smaller optical spot/flood system that’s 200 watts. Photographers work with plenty of these for subjects as large as cars. They illuminate a set with tiny areas of light exactly where they’re wanted. The light focuses the viewer’s attention to a specific place. 🌸

The Dedolight 200 Series is a smaller optical spot/flood, with similar operational characteristics. It has approximately 1-stop less light output. The ballast is much smaller, as well, allowing the system to fit in luggage than can be carried on an aircraft.



The optical spot/flood is not the only HMI that utilizes front end lenses. The DedoPAR, which we discussed on pages 344 & 345 comes with three attachment lenses that fit over the front reflector. These spread lenses (flood, spot, and medium) alter the PAR's light quality and make the instrument all the more versatile.

Detailing a Tabletop Shot

We're not sure which is more complex: shooting people or tabletop shots.

It's nice when you get the crystal stemware to smile just right. It's also rewarding when the talent doesn't move a muscle, all night long, so you can make a minor adjustment in the morning.

Time is money. You cannot think of a tabletop shot as something that you can shoot over the course of a week, when the client is paying you for only four hours.

The longer the HMIs burn, the more of the clock is ticking on the lamp's life. We try to work as efficiently as possible and shoot as many images as we can in a day. Some projects demand attention to detail. Solutions are not immediately evident.

For the image to the right, the reflection in the crystal had to be perfect. Combining a DedoPAR and a Dedolight was the best answer. Adding a little reflection with a Westcott Illuminator created the final needed touch that gave the shot its balance.

There are other possible approaches. Some would have chosen to light this with a soft bank. That would have added guaranteed speculars, if the bank were large enough.

However, that was not the look we wanted.

This was a project where we gave the stylist, Tracey Lee, total control of the content. We have

been working with her for more than twenty years, and she's always done an impressive job. We like to build a synergy with our team.

The downside to that is where all of the advanced planning is lost. We know approximately what we are going to shoot, but we don't have all of the specifics together, until we arrive at the location.

We had to put together more than one setup until the shot was perfected.

In the first setup, we naturally chose to make the DedoPAR our key light and the Dedolight in flood position our fill.

It lacked the control that we sought.

Once we switched the two around, it all started to happen.

The optical compression that the 200mm macro lens offers, on a Nikon D2x, with its 35mm equivalent of a 300mm, provides the unique relationship between the three stems. This is where planning your depth of field can make or break your shot.

We wanted only one stem to be in sharp focus. If the viewer were able to see the flowers too distinctly in the background, it would have been distracting.

Our focal point is not on a subject; it's somewhere in front of it. Knowing the hyperfocal distance (*see page 94*) helped in learning how to achieve the look we were after. 🌸

Tech Specs

Photographer

Brian Stoppee

Stylist

Tracey Lee

Illustrator

Janet Stoppee

Camera

Nikon D2x - ISO: 100 • Shutter Speed: 1/8
Manual Mode

Lens

Micro-Nikkor 200mm f/4 IF
35mm Focal Length: 300mm @ f/11

Lighting

- 1 - Dedolight HMI Daylight Head
- 1 - Dedolight DedoPAR Light Head with Reflector
- 2 - Dedolight HMI Electronic Ballasts
- 2 - Dedolight Barn Doors
- 1 - Westcott 30" Sunlight Illuminator

Light Meter

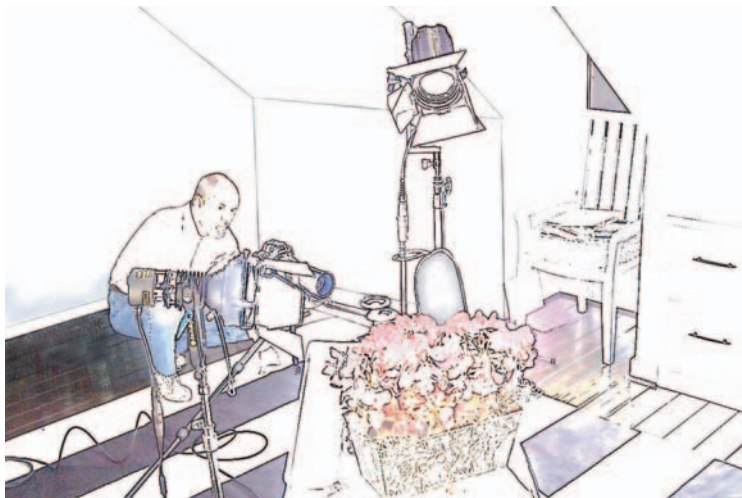
Gossen Starlite

Support

- 1 - Gitzo Explorer Tripod
- 1 - Gitzo Off Center Ball Head
- 1 - Matthews Premie Baby Stand
- 1 - Matthews Baby Jr. Dbl. Riser Hollywood Stand

Software

Adobe Bridge, Camera Raw, and Photoshop
Corel Painter



Shooting tabletop images is a juggling act of technology and creativity. One cannot exist without the other.

In this project the balancing routine requires the right lighting setup and the best depth of field, as our top two photographic priorities.

The Dedolight 400 ballast allows us to choose 400 or 575 watts. We can also dim the HMI over a range of 200 to 400 watts.

Our other lighting controls are the four-way barn doors that come with the light heads.

The crystal stems have such gorgeous contours to them. They are a classic study in how light plays with surfaces. The success story is in how to pop out the highlights and get shadows into the crevasses, while allowing the body of the crystal to be bathed in a diffused specular.

Once we fine tuned the PAR as our fill and initially positioned our flood light as a key, it became our job to finesse that main light to provide

specular highlights to the base of the upside-down stems.

Some of the battle was won through frequent metering.

This is often the case with a tight tabletop. Every detail counts.

The flowers in the background needed to feel in concert with the stemware, as far lighting as was concerned, they too needed highlights. If not, the crystal would separate from the flowers too dramatically.

Both the foreground and the background carry the same kind of levity.

This is the mood of the shot.

It needs to feel as if a joyous occasion is about to be celebrated. We wanted the viewer to feel as if they just couldn't wait for those stems to be flipped over and filled.

The Westcott Sunlight Illuminator, that's on the stand, provided just enough kick-back into the base of the stemware's left side to nicely polish off the reflections on its beautifully faceted surfaces.



The Projector and Gobos

The projector attachment and available gobos (explained shortly) are another aspect of what makes HMI so attractive to photographers. It's not something that most of us are used to with flash.

The Dedolight Series 400 Imager is a modular optical system that goes with the 400 series spot/flood that we have been discussing.



We use it for more than just special effects. It's great for tiny accents of controlled light. It goes right onto the front of the light head, just like any other accessory. There are four shutters to close down light and a lens that pushes and pulls into focus.

The term "gobo" is short for "go between." The imager allows you to place gobo pat-

terns in the path of the light. In the next two pages, we photograph a Scrabble board and use the

Imager to project the pattern of light coming through venetian blinds using the above gobo from Rosco. 🌸



A Westcott Illuminator diffusion panel has come between the light source and the subject. Because of the spherical and glassy nature of the objects, it was important to capture an even reflection.

Tech Specs

Photographer

Brian Stoppee

Stylist

Tracey Lee

Illustrator

Janet Stoppee

Camera

Nikon D2x - ISO: 100 • Shutter Speed: 1/125
Manual Mode

Lens

AF-S Zoom-Nikkor 28-70mm f/2.8 IF-ED @ 48mm
35mm Focal Length: 48mm @ f/5.6

Lighting

- 1 - Dedolight HMI Daylight Head
- 1 - Dedolight DedoPAR Light Head with Reflector
- 2 - Dedolight HMI Electronic Ballasts
- 2 - Dedolight Barn Doors
- 1 - Westcott 42" 2-Stop Diffuser

Light Meter

Gossen Starlite

Support

- 1 - Gitzo Explorer Tripod
- 1 - Gitzo Off Center Ball Head
- 1 - Matthews Premie Baby Stand
- 1 - Matthews Baby Jr. Dbl. Riser Hollywood Stand

Software

Adobe Bridge, Camera Raw, and Photoshop
Corel Painter



Projector Attachment and Mist Effects

Some uses for the Dedolight Imager are just too much fun to pass up.

Our main light is a simple bounce off a nearby white wall. The Dedolight 400 with the DP400 Imager provides the accent light. The projector is loaded up with a gobo of venetian blinds.

To make the entire setup more challenging (we can't stand a dull shoot), we enlisted the services of the Rosco 1700 fog machine. This is a darling of the theatrical world. Unlike all the messy oil-based fogging devices, the Rosco uses a water-based fluid that does not stain or leave any residue.

We manipulated the HMI side of the equation first. Until we were satisfied with the balance between the fill and the accent, it took some trial and error (more of the latter).

Because the game board has a neutral density tone, the meter, in its spot mode, was perfect. Yet the image was not so inspiring without the special effects of the haze.

The fog machine is used to fill large theaters and sound stages with mist. We are familiar with using it outdoors, where even a light breeze requires a significant application.

In our small work space, a tiny puff would have done the job. The Rosco 1700 doesn't do tiny puffs. Within seconds, visibility was down to five feet. It was perfect. It took a little

while for enough fog to clear, but once it did, we had ample time to capture the mist exactly as we wanted it.

The fog machine not only put fine moisture particles in the air, without causing any noticeable change in humidity, but also added a minor amount of diffusion to bounce light, which proved to be exactly what we wanted.

The gobo felt realistic to us. The balance between the bounce and the projection seemed even. Adjusting distance between the projection source and the subject, plus the focusing on the Imager, took a little work until we found just what we were after. A formula for how to best find that equilibrium probably does not exist, so just make it enjoyable. 🌸



A haze effect should be barely noticeable, but add to the atmosphere of the image. Find the right balance with the gobo of the blinds and the main light.

Tech Specs

Photographer

Brian Stoppee

Illustrator

Janet Stoppee

Camera

Nikon D2x - ISO: 100 • Shutter Speed: 1/8
Manual Mode

Lens

AF-S Zoom-Nikkor 28-70mm f/2.8 IF-ED @ 62mm
35mm Focal Length: 93mm @ f/16

Lighting

- 1 - Dedolight HMI Daylight Head
- 1 - Dedolight DedoPAR Light Head with Reflector
- 1 - Dedolight DP400 Imager
- 1 - Dedolight Gobo Holder
- 2 - Dedolight HMI Electronic Ballasts
- 1 - Rosco Gobo
- 1 - Rosco 1700 Fog Machine

Light Meter

Gossen Starlite

Support

- 1 - Manfrotto Tripod with Quick Release Head
- 1 - Matthews Premie Baby Stand
- 1 - Matthews Baby Jr. Dbl. Riser Hollywood Stand

Software

Adobe Bridge, Camera Raw, and Photoshop
Corel Painter

THE NEW

THE NEW
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EDITION

VOLUME 2

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Wireless Battery Flash

If you have not taken a fresh look at battery flash since 2004, then you have never seen battery flash.

Today it's a small battery-operated version of a full-blown AC studio flash system, with all sorts of automated capabilities that even the most technologically advanced daydreamers in professional photography could not fantasize over if they devoted an entire week to it.

It marries the digital flash and the camera in a harmonious and sometimes interdependent relationship.

Much like an HMI ballast or a studio flash power pack, these relatively small flash units have a central control panel, right above your camera's viewfinder. It's completely wireless, so flash units can be hidden in all sorts of places where big instruments cannot go unnoticed.

The amazing thing is that so much of it is automated. Readings are taken by the camera and the flash units respond, a good distance away. It's either completely at the photographer's control, or the shooter can give some or all of it over to the digital system.

Because of its size, the system is incredibly transportable. A little lighting system can fit in a camera bag that goes with carry-on luggage on an airplane.

Like many things that we have been exposing you to in this volume, it's all part of a fresh new digital frontier that's wildly exciting now, and evolving further all the time.

You have to explore it. 🌸

What the Camera Does

We credit Henry Fox Talbot, the English inventor of many things photographic, with the discovery of flash illumination back in 1851.

A little progress has been made since then.

Why Battery Flash?

We, like many professional photographers, have a variety of artificial light sources available to us: AC flash, daylight fluorescent, HMI, and even some hot lights. So, why do we want battery flash?

For wedding photographers, the battery-operated flash is a must for all the reception candid. Some monster flash units, sometimes not so affectionately known as “potato mashers,” once ruled the roost with wedding shooters.

There are also some battery flash units that resemble a shrunk version of a studio flash system. They have a small flash head plus a combination power pack and battery that you wear over your shoulder. These are primarily manual mode products. They were once popular with photojournalists, too.

Today, there’s a great deal of power in flash units from camera manufacturers, and they have the attention of all kinds of professional photographers. Some third-party producers are entering the market with flash units that can tap the camera’s brain, too.

Admittedly, back in the 1980s and 1990s, when professional photographers told us that they didn’t need AC flash; small battery-operated units provided all that they needed, we’d politely smile.

For us, it’s always a matter of what works for the situation. Battery flash has to bring something to the table that none of our other systems have to offer.

The benefits are many. There are often circumstances where we are not allowed to haul in a ton of gear. It’s considered too disruptive. Other times we have to set up fast.

When there’s no AC power and we can’t use a generator, what are our alternatives?

Sometimes we need to get lighting into small places. Big lights won’t work. Wires get in the way. Wireless is the answer.

Small subjects are best lit with small lights. It’s easier to control.

The Camera’s Role

The digital single lens reflex (dSLR) camera is a key player in what you can do with battery-operated flash.

There’s more than one contact on your camera’s accessory shoe (a.k.a. the “hot shoe”).



Not only is your camera’s lens talking to the camera, but the flash is doing its share of communicating, as well.



Flash Bracketing

On page 89, we got into exposure bracketing, and on page 120 discussed bracketing color temperature. You can do the same with your flash. Please refer to page 89 and from the menu choose either “AE & flash” or “Flash only.”

TTL Flash Metering and Monitor Preflash

If you’re into the technology of how it happens, this is the fascinating part.

As previously discussed, the dSLR has amazing through-the-lens (TTL) metering capabilities. So how on earth does the camera measure flash in the fraction of a second that the flash duration lasts?

It fools you.

The Nikon Speedlights put out a series of “monitor preflashes” that are nearly invisible, right before the main flash is fired. These allow the camera to analyze the information that is reflected back.

Red-Eye

Red-eye occurs in photos when the flash is fired directly into the eyes of the subject and the flash position is above the lens. The flash illumination strikes the blood-rich vascular area of the eye and reflects back to the camera. In this case, the angle of incidence and the angle of reflectance is pretty much one and the same. The conditions for causing red-eye are enhanced in a darker space. The subject's eyes are naturally dilated to let in more light.

Because the flash happens so quickly, the pupil does not have time to react and closes down a bit. Obviously, this doesn't happen when the light source is coming from a different angle or the lighting level of the space is higher.

Red-Eye Reduction

Your dSLR and flash may be able to help reduce red-eye. When you change the camera's flash sync-mode to Red-Eye Reduction, it fires a pre-flash approximately one second before the main flash fires. It can be a pulsed flash. This gives the subject's pupils sufficient time to react and preconditions them for when the main flash fires.

Not everyone's eyes react similarly. Children's pupils are generally slower to respond to light, than those of an adult.



The Camera's Flash Mode

When engaged in flash photography, you have a few options as to how the camera will react. *(If you have not read about shutter curtains on pages 66 & 67, you will want to read that first.)*

On our Nikon dSLRs, you change the flash mode by holding the flash mode button (which looks like a lightning bolt) and flip through the main command dial (the one on the back). As you do this, you'll see graphics change in the control panel. The options are:



Front Curtain Sync: This is the mode for most uses. It fires the flash right after the front curtain opens. (This is important when compared to what happens with rear curtain sync.) When in programmed autoexposure and aperture priority modes, the camera chooses shutter speeds ranging from 1/60 to 1/250 of a second. If a Nikon Speedlight is in use, and the Speedlight's Auto FP High Speed Sync mode is chosen, then sync speeds as fast as 1/8,000 of a second are possible.

Slow Sync: When using flash, and then allowing the shutter to drag, you create an extended exposure, as we discussed on pages 72 & 73. Unlike that example, when the camera is in manual mode for use with studio flash, Slow Sync is designed for use with Nikon Speedlights. Use it with programmed autoexposure and aperture priority modes.

Rear Curtain Sync: Sometimes beautiful blurs work and other times they make no sense. If you have ever attempted a flash plus a long exposure and the blur was in the wrong place, here's what probably happened. In shutter priority and manual exposure modes, the flash should fire right before the rear shutter curtain closes. In programmed autoexposure and aperture priority modes, choose Rear Curtain Sync if you want to capture both the flash exposure and the background, especially

where motion is involved. If not, you get something of a reverse motion effect. If you were to photograph a moving car at night, with flash, at a slow shutter speed, rear curtain flash provides a beautiful trail of red tail lights behind it. However, in Front Curtain Sync mode, the flash fires and then the car passes by. That leaves the tail light blur superimposed over the car.

Red-Eye Reduction: This is the red-eye reduction mode that we just discussed. If you must shoot with on-camera flash and have people looking directly into the camera in a darkened space, this is your best bet. On our Speedlights we see three little flashes before the main one fires.

Red-Eye Reduction with Slow Sync: This combines the two named modes. Some flash units allow you to change these settings directly on them, rather than needing to use the camera's controls.

Flash Exposure Lock

Because the dSLR has so many innovative means of enhancing flash exposure automatically, you need a means of locking a flash exposure just as we discussed for ambient lighting on page 87.

This is a little tricky on some dSLRs and it works with only certain flash units. On the

high-end Nikon cameras you need to find the Function button, which is just below the depth of field preview button. You'll also need to select how it's used in the menu.

Go to the Custom Settings menu (the one with the pencil icon) and follow these steps with the Multi Selector's right arrow (*the following menu numbers are different on some Nikon models*):

- f..... Controls
- f4.....FUNC. button
- FV lock (choose OK)

With a SB-600, SB-800, or SB-900 Speedlight on your camera and operating, compose your subject in the center of the frame, press the shutter release button halfway down; the monitor pre-flash will fire. Press the Function button. That exposure is now locked in and the control panel and viewfinder will show you that. It'll stay there until you press the function button again. 🌸



Tech Specs

Photographer

Brian Stoppee

Camera

Nikon D2x - ISO: 100 • Shutter Speed: 4 seconds
Manual Mode

Lens

AF-S VR Zoom-Nikkor 70-200mm f/2.8G IF-ED @ 70mm
35mm Focal Length: 105mm @ f/11

Light Meter

Gossen Starlite

Support

- 1 - Gitzo Mountaineer
- 1 - Gitzo Off Center Ball Head

Software

Adobe Bridge, Camera Raw, and Photoshop

Though no flash was used in the image to the right, we can see that all of the tail lights provide a sense that the vehicles are moving away from us. They were close to the camera when the shutter was opened, and four seconds later, they were further down the road. If a flash were used for an exposure this long, Rear Curtain would be essential. Should you choose to use flash at night, it may be best as a staged scene. Flash can distract people and cause safety issues, blinding drivers.



The Sophisticated Flash

As sophisticated as the battery-operated flash has become, the concept has been the same for decades.

The batteries supply the power to a capacitor that acts like a little cylindrical storage tank of high-voltage energy. At the exact second that the camera tells it to, the flash unit releases a specific portion of that energy to the flash tube. The tube is filled with a xenon gas. The quartz glass tube has electrodes on either end. The energy discharge excites the gas. It ionizes the gas path and a very brief flash of light results. The flash lasts only from 1/100 to 1/10,000 of a second.

Safety

A flash unit is quite well sealed. It has no user-serviceable parts. If for some reason the case is broken cease using it and seek professional repair. This is a high-voltage unit. Do not be fooled by the fact that it only uses a few little batteries that you can find at the supermarket checkout stand. The energy that's stored in the

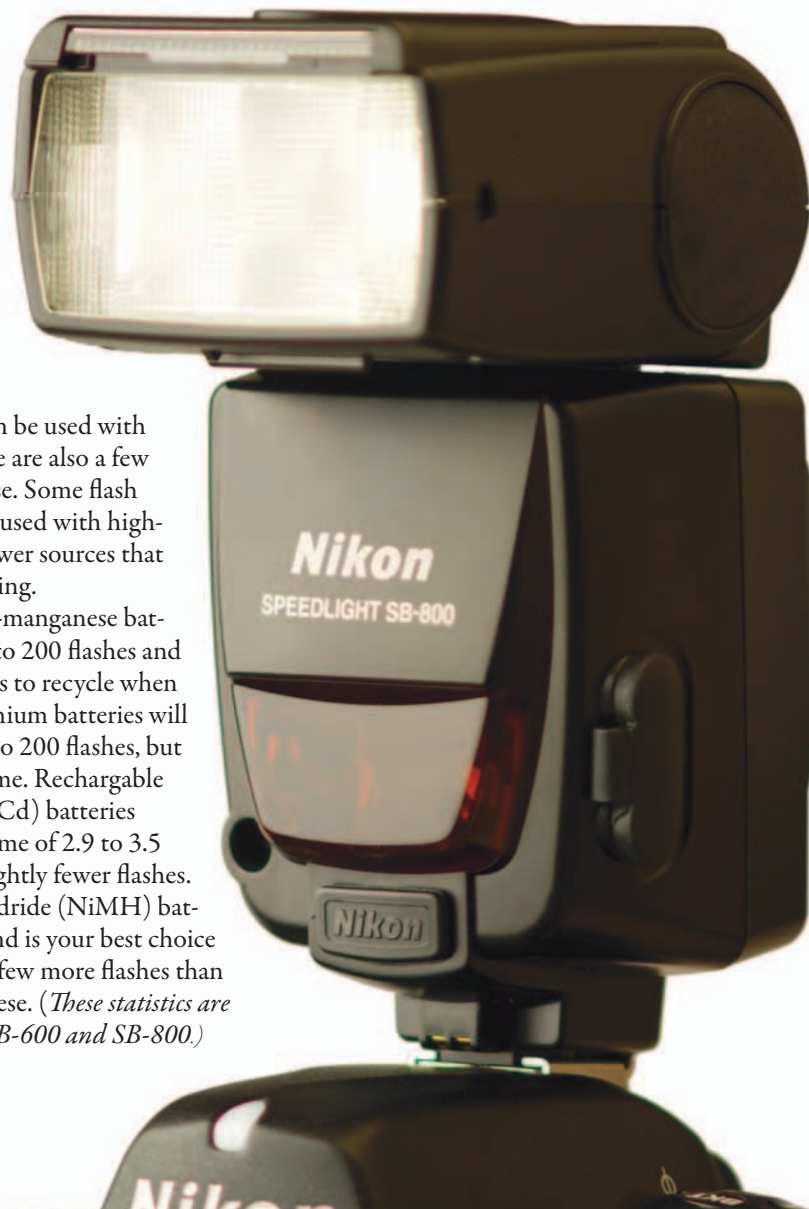
capacitor is a few hundred volts.

Coming in contact with that sort of energy can do more than ruin your whole day.

Batteries

There are all sorts of battery types that can be used with your flash unit. There are also a few that you shouldn't use. Some flash units overheat when used with high-powered external power sources that promise faster recycling.

The basic alkaline-manganese battery is good for 130 to 200 flashes and takes 3.5 to 5 seconds to recycle when fully discharged. Lithium batteries will buy you another 60 to 200 flashes, but slow the recycling time. Rechargeable nickel-cadmium (NiCd) batteries get you a recycling time of 2.9 to 3.5 seconds, but with slightly fewer flashes. The nickel-metal hydride (NiMH) battery also recharges and is your best choice for recycling, with a few more flashes than the alkaline-manganese. *(These statistics are based on the Nikon SB-600 and SB-800.)*



Always replace all the batteries at the same time with the same type and brand.

If your flash unit can accept an extra battery (pictured on page 364), for faster recycling, go for it.

Resetting

One of the downsides of a sophisticated flash unit is that as you travel through the many available settings and custom configurations, you can get lost and have a tough time finding your way home.

Get to know where the reset buttons are located. On a Nikon Speedlight, hold down the Mode and On/Off button for approximately 2 seconds and you're back on familiar ground.

Custom Settings

Before you do anything else with your flash, figure out how to set the custom priorities before it drives you nuts. If the flash unit is displaying distances in meters and you need feet, change it now.

If the display panel has switched to standby, hold down the on/off button until it comes back on.

On a Speedlight, hold down the Select button in the middle of the multi selector for a couple of seconds. You'll get a new menu in the display panel. Use the up and down arrows to cycle through the options. When



you're done, hold down the Select button for a couple seconds again, and you're back to where you were.

Flash Mode

The flash mode of the flash unit and the flash mode of the camera are not one and the same. On the flash unit, you select what you want the flash to be doing at this moment. When pushing the Mode button, your options are:

TTL - Through the Lens Auto: This option gives the camera control over the flash. As the camera's sensors see the light being reflected back to them from the monitor preflash, they take over the automatic operation.

TTL BL - Balanced Fill: When you have white walls of other reflective surfaces, the overall scene can be poorly exposed. This mode reaches an even balance.

A - Non-TTL Auto Flash: The flash unit accurately measures the light reflected back to it and arrives at an exposure without the camera's measurements, if they are unavailable. The flash unit does the automatic exposure calculations.

AA - Auto Aperture: This option is for when the camera is in Aperture Priority mode.

GN - Distance Priority Manual: This is a great option when you know the distance that you want the flash to throw its light. The range is 1 foot to 65.6 feet.

M - Manual: This one uses a guide number calculation chart for flash output levels of 1/1, 1/2, 1/4, 1/8, 1/16, 1/32, 1/64, and 1/128.

RPT - Repeating: To obtain a repeating flash stroboscopic effect, choose this mode to build a series of flashes during a single exposure. This is popular for motion effects.

Modeling Illuminator

One of the things that people complain about with flash is that they are clueless as to how the light is going to look until the photo is made.

A cool little tool is the Modeling Illuminator. Press the button on the flash unit and it gives you a little flash buzz of light to help you previsualize the scene. 🌸

Bouncing and Fast Fill Flash

We're all familiar with the basics of bounce flash. However, it has always come with a certain degree of mystery.

The Better Bounce

Photographers have studied the effects of bouncing light off of a ceiling or a wall. We're told that it reduces the harsh shadows. We can see the results. However, until the shot has been made, we really don't know what we have.

This conundrum is magnified by the fact that if we are using on-camera flash, we're probably photographing something that has a certain degree of urgency to it. We have no time to set up lighting.

The Modeling Illuminator in Action

Here's when you put the Modeling Illuminator to good use. Depress the flash unit's tilting/rotating lock-release button. Tilt it up and down. Rotate it from side-to-side. Even do a 180° rotation or so, bouncing light off a surface behind you.

With each move, visualize the end result by pressing the Modeling Illuminator button. You can see the highlights and shadows that the bounce effect will provide. This flashes at a reduced level of intensity, so it isn't zapping your batteries.

Unwanted Reflections

Keep in mind that when you bounce flash, every color characteristic that your chosen surface has becomes something akin to a huge colored filter. If you've chosen a cream-colored wall, you have a nice warming effect. However, if your only available surfaces are a forest green, your subjects may look somewhat unhealthy.

Automatic Exposure to the Fill Light Rescue

Part of what makes this all possible is the automatic exposure capabilities of your camera as it communicates with the flash, plus the variations available in flash modes.

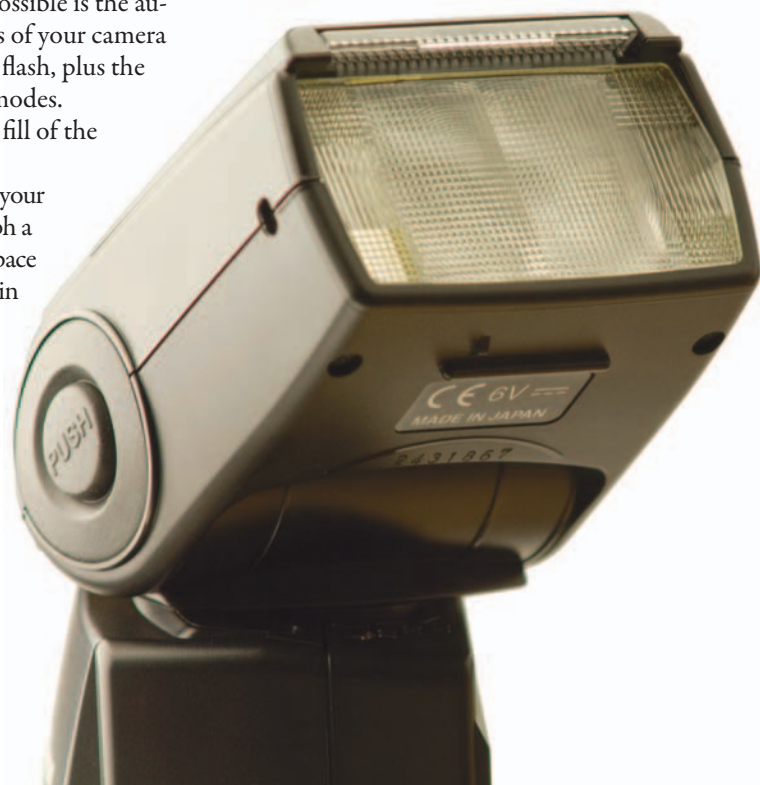
The results are a beautiful fill of the ambient conditions.

Try this out yourself. Setup your camera on a tripod. Photograph a subject in a well-illuminated space without the flash. Shoot it again in TTL mode. Try it a third time in the TTL BL mode. The results can be stunning.

It's enough to make you fully rethink fill flash. It really pops out the clarity of shots without the overbearing glare or artificial appearances that were once associated with it.

Diffuse It

To further lighten your flash load, pop a diffusion dome over the flash head. It does scatter the light, reducing the efficiency of the unit. However, if it has the lighting effect that you need, let the automatic exposure worry about the efficiency for you. ☀





Tilting and rotating the head of your flash unit is one of the most versatile assets of on-camera flash.

Photographers who cover events have mastered these techniques. They can look at a wall or a ceiling or any interior or exterior surface and see it as a large light source. These photographers learn to quickly angle their on-camera flash to turn that surface into a bright light.

Wedding photographers have built sparkling portfolios of the moments before the wedding, as the bride is getting ready, using bounced light as their single source of illumination. These can be some of

the most cherished images in a wedding album, just like those from the reception.

Coarse, hard illumination doesn't cut it for this sort of photography, especially in large spaces.

Because this consumes a great deal of battery power, the wise photographer comes prepared. Rather than taking a time-out to change batteries, many photographers grab that second flash unit that's already loaded with fresh power, ready to go. Losing a special moment would be unfortunate.

If you have these sort of battery flash needs, don't skip on flash output. Get a powerful flash unit.

Experiment with bounce flash until you feel comfortable with it. A good sense that you have reached a comfort level is when you are able to look at a surface and have a visualization of the end result. Take a shot and see whether what's in your head matches what you captured.

Besides bouncing off the ceiling and walls, consider standing with your back to a wall and using the wall behind you as your bounce surface.

Photographers who cover motion picture production learn to utilize the scrims that the production company is using for filming without touching them.

Off-Camera Flash

Get that on-camera flash off your camera and start making some really great photos.

The chapter divider image on pages 358 & 359 was shot with a Nikon Speedlight SB-800, off-camera. It allowed us to angle the light perfectly. We shot it with the flash in the most basic TTL mode, and the fill light is very clean. There's a little more illumination on the butterfly and the blooms than on the background, so the foreground separates well from the background. Because the flash is off-camera, the delicate blossoms have more dimension to them with a highlight coming in from the left and light shadowing on the right.

The Power Bracket

All of this is made possible with a power bracket. These accessories have been a vital tool of photographers covering events for years, be that a wedding or a news conference.

Once this tool came into the digital age, the possibilities created a whole new game of great image-making.

More Battery Power

The Nikon SK-6 Power Bracket, which we use, is both an external power source as well as a mounting bracket that works in flexible combinations. The extra power reduces the flash unit's recycling time by half. At the same time, the extra four batteries that install in the bracket nearly double the amount of flashes that are available before you need to change the batteries. This is perfect for covering events, when stopping to insert a fresh set of batteries means losing that best shot of the day (which could make you quite unpopular).



Fast

The whole set includes just three components, so it goes together fast.

The bracket attaches to the camera just like a tripod and forms the link to the Speedlight mounting unit. The bracket slides left two inches for adjustments, and the whole rig can tripod-mount, too.

You can connect the mounting unit in an upper or lower position and snaps it into place. A release lever instantly dismounts from the bracket.

The mounting unit cables to the camera's accessory shoe, but allows the flash to

be freely moved almost two feet from the camera. This is made easier by the mounting unit's convenient drop-down handle, so you can hang on to the handle while holding the mounting unit with the Speedlight cradled in it. Experiment with the detached unit while shooting nature, before getting into live action. You'll quickly become addicted to the added recycling time, to the point that when you are not using the power bracket you'll feel as if the flash is a little slow.

Safety

Though rapidly mounting and dismounting the unit is a powerful option, resist the temptation to not lock it to the bracket with the big coupling screw.

It's also best to keep the grip in the up position, when not in use. It gives the Speedlight and the grip more protection when you set it down or are moving about with the camera to your eye.

Finally, remain cognizant of the space around you. With your eye to your viewfinder, and your other hand moving about with the flash, it's possible to smack a passerby in the head, especially if you are covering a social event or function where people's minds (and bodies) can be elsewhere. ❀

A flash bracket is the best way to get off-camera and still remain connected. Not only is your angle of light improved, but the additional battery power improves your recycling time.



Control the Wireless Flash Studio

For any professional photographer who has been working with AC studio flash units for years, it's difficult to get used to the vast power and flexibility available from a system of battery-powered flash units.

It's very real.

It's very fast.

It's all manipulated from the one button and single multi selector on the flash that's attached to your camera.

Because there's no limit to the number of flash units that you can control, and the whole thing is wireless, it seems too good to be true. The controls for all that light are just a few inches above the same eye that you use to look through the viewfinder.

The Master and Remotes Relationship

The flash unit, that's directly attached to the camera is known as the "master flash unit." The others are the "remotes."

The remotes cannot be in standby mode when used as part of a system. To turn off standby on a Speedlight, hold down the select button for a couple seconds. The control panel will show you a "STBY" box. Press Select. Use the up and down arrows to get the "----" option. Hold down the select button for a couple seconds. Remember that this is not the best mode to conserve battery power.

We recommend that you turn on the remotes right before you begin shooting.

Mounting the Remotes

The remotes need some sort of support. The Speedlight comes with a little base that the flash unit slips into, just as it would the accessory shoe of the camera. If you flip the base over, you'll find the standard 1/4-20 tripod socket. You want something as supportive as possible for this.



Novatron has a 4053 adapter that goes from 1/4-20 male to 5/8" female. This is perfect for mounting the Speedlight's base to a sturdy light stand.

Another option is to clamp the flash unit's base to one of the Matthews support products that we discussed on page 313, then mount the clamp to a stand.

Programming the Master

Hold down the select button again for two seconds and use the up and down arrows to find the graphic of the two "s" curved arrows. Press Select. Use the down arrow to choose Master. Press Select again for two seconds.

The control panel now looks very different. You have converted the Speedlight over to a very different creature than the one that just sits on top of your camera.

Cycle through the options on the new menu by tapping the Select button. Use the up and down arrows to make changes, then press Select.

Programming the Remote

Now, do the same to the remote units. Hold down the Select button for two seconds. Find the same graphic with the two "s" curved arrows. Press Select. Use the down arrow to choose Remote. Press Select. There's a little

music note to let you know that the remote will beep when it has recycled. If you don't want the sound, go over to it and turn it off. Hold Select for two seconds.

The control panels for the remotes differ from the master.

Channels

You can communicate over four different channels (1 through 4). Be sure that all the flash units are talking on the same channel.

Groups

The Nikon Creative Lighting System (CLS) allows you to include all the flash units that you want. There's no need to run around and change things on the remote units. All of that happens on the master. Control the remotes as the members of a group. If you had six Speedlights, the setup could be:

Master: There's a small Speedlight on top of the camera.

Group A: This is your key light. It's just one unit, bouncing into a medium silver umbrella on your right. Press the select button on that remote until Group is highlighted, then use the up and down arrows to enlarge the "A."

Group B: Your fill light is bouncing into a large white umbrella from one flash unit to

your left. Follow the same setup for Group "A" to set "B."

Group C: Three flash units are illuminating a huge interior background behind your subject. They're just sitting on the ground pointed toward the background surfaces. Set all three of these to "C."

Controlling from the Master

Now that the remotes are set, forget about them. Control everything from the master.

The master unit doesn't have to fire. It can just be the commander. Press Select to highlight the "M." Press the Mode until it just reads "---."

Press Select again, and Group A will be highlighted. Press the Mode button until you get "TTL 0.0" for your key light.

You want only a modest amount of fill light. Press Select again, and Group B will be highlighted. Press the Mode button until "TTL 0.0" appears.

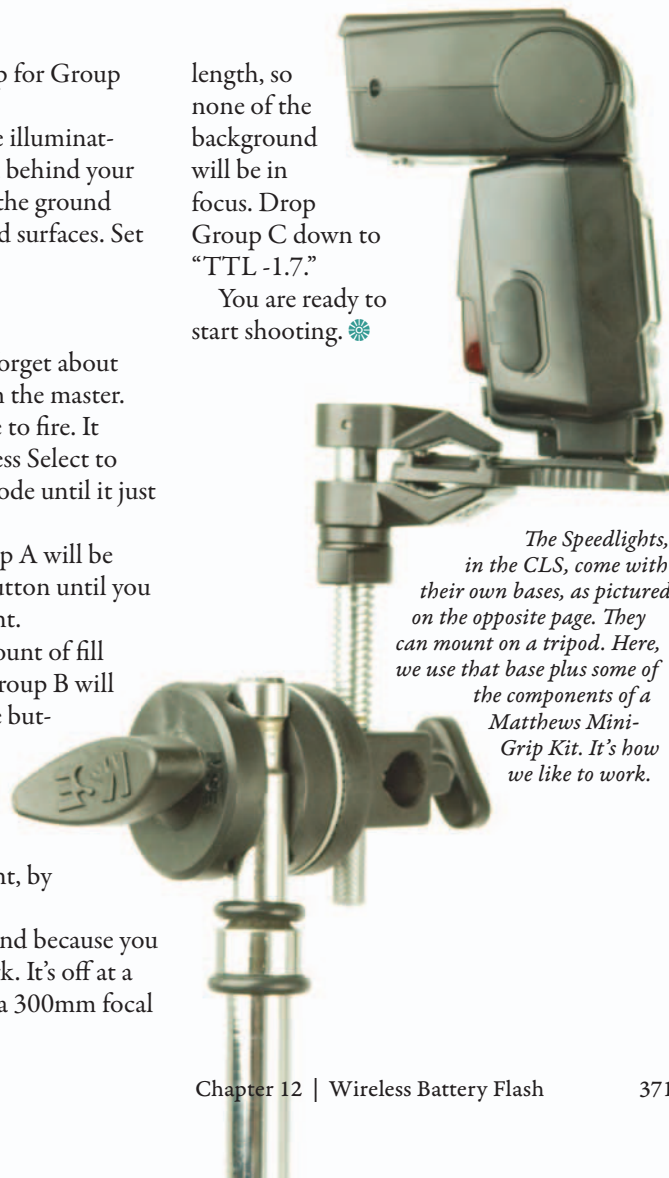
You can compensate up or down 3-stops, in third stop increments. Now, use your down arrow to drop the fill light, by 1-stop.

You're lighting the background because you don't want the space to feel dark. It's off at a distance; you're shooting with a 300mm focal

length, so none of the background will be in focus. Drop Group C down to "TTL -1.7."

You are ready to start shooting. 🌸

The Speedlights, in the CLS, come with their own bases, as pictured on the opposite page. They can mount on a tripod. Here, we use that base plus some of the components of a Matthews Mini-Grip Kit. It's how we like to work.



The Macro Flash Tool Kit

Once you get the hang of the Nikon Creative Lighting System (CLS) you can pick up any of the products and feel right at home.

We have many years of experience in producing media materials on weather and the environment, starting with NBC News, in



The commander unit slides into the camera's accessory shoe, just like a flash unit, yet it emits no illumination. It's the CLS control center, taking charge of all other Speedlights.

1995. We've been involved in master gardening. Obviously, we love to shoot macro images of botanical subjects and all sorts of things that we discover in nature.

Clearly, we fell in love with the Nikon R1C1 Close-up Speedlight Commander Kit, even before we had the whole thing unboxed.

If this looks familiar it's because investigators in all the television crime shows have them wrapped around their camera lenses.

Putting It All Together

There are plenty of pieces that come in a very well-organized case and if that's not enough, soft cases are included for the key components and they fit on a belt.

Little Speedlights

The system has two SB-R200 special wireless Speedlight flash units. They work similarly to the SB-600 and SB-800, in remote mode, as we discussed on the previous four pages. Instead of programming them from a special menu, all the functions of choosing channels and groups happens with dials on the flash units. They come with the base units

The Select button allows you to navigate your way through the commander's menus, just as the same button does on a Speedlight, when it's in Master mode. All of the CLS tools are very similar.

similar to those of the bigger Speedlights, for sitting on a surface or being mounted.

Many users will want to mount the Speedlights to the attachment ring. They lock in place and can be moved around the ring. The flash units easily tilt back and forth, for excellent aiming at the subject.

The kit includes five adapter rings, so the attachment ring can be mounted to a lens.



The Speedlight Commander

The SU-800 works just like a full-sized Speedlight in master mode. However, the Speedlight Commander produces no light; it just gives orders to its Speedlight underlings.

The Commander is a bargain, if you own other Speedlights and use one of the flash units as an on-camera commander and not as a flash. The SU-800 frees up a Speedlight to illuminate subjects.

We won't bother taking you through how to operate the Commander. If you read the previous four pages, you'll be able to handle it. 🌸



Unlike the larger Speedlights, these little units do not need an LCD control panel to select remote settings.



These little Speedlights snap onto the attachment ring and travel independently over 360°, with convenient click-stop positions. They can be placed anywhere on the ring. This is great for hand-held

shots. However, the ring is not a necessity for their use. The Speedlights are wireless and can be placed anywhere. They come with their own self-standing bases, which also tripod-mount.

Revealing the Macro World

Photographing a macro world has a special magic to it. Nature's tiny environment becomes huge. The smallest details, a few millimeters in size, grow many times larger.

When you introduce great lighting into the equation, a visual drama builds.

Though the Nikon Close-up Speedlight Commander Kit (which we discussed on the

previous two pages) is often used with one flash unit on either side of the lens, nothing says that you need to do it that way, too.

Flip both flashes to one side or shut one off. Get them off of the ring and place them on stands, or an arm, or use them on the Matthews Hollywood Superflex Flex Arm, which we discussed on page 314.

Make this macro world your very own world. Tell the story your way.

Both of these images were shot with a Nikon D2x and a Micro-Nikkor 200mm *f*/4 IF. So our 35mm equivalent focal length was 300mm. It's what makes this macro world so very much larger than life.

Our use of sidelight adds a sense of mystery to the photos. We shot at a greenhouse and moved plant materials into an area with minor illumination. Everything was done in manual mode as we took readings and monitored how the images appeared on our computer screen.

Another joy of macro photography is that the subject doesn't need to take breaks, doesn't require that it be paid overtime, and if brought indoors, will remain still for prolonged periods of time. You are afforded a little time to experiment with your options.

One of the cautions to this sort of photography is that a minor adjustment to the illumination, or any other element, is a huge change to the image. Lighting macro photography requires special care but yields big colorful pleasures. 🌸

Both photos become far more grand, in human scale, at a 300mm focal length. They are shot with sufficient resolution that they can easily be printed as 24" x 36" images.





On the Tabletop

One of the fastest photos that we have ever shot with a light bank is to the right. Anyone can do it. In fact, it was so easy, it's almost embarrassing to shoot like this and claim to be a professional photographer.

However, the image speaks for itself.

The Speedlight and the Camera

Just as discussed on pages 372-375, we are using one Speedlight as a controller that does not fire, and another in the light bank as a remote that is the sole light source.

Here's where it feels like cheating. Once we have spent all of around two minutes setting the Speedlights, we go to programmed autoexposure mode on the camera, as well as autofocus. Some would say that's entry-level user stuff. To some degree, they are correct. On another level, the creative team is still making all the visual decisions. All of what we see, with the lighting, camera angles, focal length, set styling, and so on, is all our choosing.

Arguably, we have allowed the camera/flash unit combination to tell us what aperture will be chosen (for this sort of shot, the shutter speed is inconsequential). Admit-



tedly, we went into this project surrendering ourselves to that, to see what would happen.

The Speed Ring and Setup

We could have knocked down this project in less than an hour, from setup to strike, except for one small glitch. Someone borrowed both of our Chimera speed rings for Nikon Speedlights and lost a few of the parts. There's an important lesson to be remembered from Boy and Girl Scouts: "Be Prepared." Our Matthews MiniGrip Kit had all the tools to convert an old Novatron Speed Ring into just what the doctor ordered. *(Please see page 315 to learn what came to the rescue.)* 🌻



Our little antique coffee grinder took less than an hour, from start to finish, even with some glitches and three test shots for composition and lighting angles. The technical side was completely auto-programmed.

Tech Specs

Photographer

Brian Stoppee

Illustrator

Janet Stoppee

Camera

Nikon D2x - ISO: 100 • Shutter Speed: 1/60
Programmed Auto

Lens

AF-S VR Zoom-Nikkor 70-200mm f/2.8G IF-ED @ 200mm
35mm Focal Length: 300mm @ f/4.0

Lighting

1 - Chimera Daylite Jr Plus - Extra Small Silver
1 - Nikon SB-800 Speedlight (as non-firing controller)
1 - Nikon SB-800 Speedlight (as firing remote)
1 - Novatron MI-010 rigged speed ring

Support

1 - Gitzo Mountaineer
1 - Gitzo Off Center Ball Head
1 - Matthews Baby Jr. Double Riser Stand
1 - Matthews Baby Boom
1 - Matthews C Stand w/Sliding Leg, Grip Head, & Arm
1 - Matthews MiniGrip Kit

Software

Adobe Bridge, Camera Raw, and Photoshop
Corel Painter





Digital Studio Flash

The AC powered flash system has been the lighting tool of choice for professional photographers over the past few decades. It has continued growth in the digital age, making the flash equipment of the previous century appear obsolete.

The advantages of these big light sources are significant.

A good flash system should produce light with a color temperature around 5,500 Kelvin. It must balance beautifully indoors or as a supplemental light source outdoors.

Technology has reduced the size of the lighting instruments. The light-making devices that were once the proportions and weight of a crate of apples can fit in a camera bag today. No longer do photographers have to fear blowing the circuit breaker while on location because their power pack demands 20 amps of power.

AC flash produces enough light to get great depth of field and stop action, as well. For the tabletop shooter looking for $f/22$, this is the answer.

Additionally, it offers some good recycling time. For people shots, this lets you knock out shot after shot as you see the action happen before your camera's eye. Whether you're shooting fashion or kids, the time is now.

Today, accurately adjusting power in increments of a tenth of a stop allows the photographer to fine-tune a photo and repeat it, again and again.

There's no good technological reason for it, but photographers just love that "big pop" when the flash fires. It has some sort of "I'm in the big time!" feel about it. The talent gets into it, too. It has come to define the rhythm of some photo sessions. 🌟

The System

Part of what photographers love about studio flash is that it's part of a big system.

There are many interchangeable components, so you are able to customize the system to your own needs.

It's much like a camera system. You want to choose a line that you like. Flash heads that work with brand A do not work with brand B, so this is an important decision.

There are plenty of new, unproven players in this game. Stick with a line that has a few decades of history.

The digital image-making world is a new one. You don't want to build a system only to find that it's no longer being made or serviced.

Look for a dealer and service network, too. If you are starting a system, you want to know that new components are readily available from many sources and that if something ever happens to it, there are many service outlets.

Some photographers travel and rent additional packs or heads when they arrive at their location. They like to know that their line of flash equipment is available in just about any city where they work.

Power Packs and Heads vs. Monolights

It used to be that one side of the aisle swore that a system of power packs and flash heads were the only way to go. The other side argued that carrying around two components to do one thing made no sense. They felt that it was best to combine the two as a single, integrated flash source that is often generically referred to as a "monolight." Some manufacturers had just the packs and heads and others only did the monolights.

With time, the market changed. The pack and head photographers, who may have been studio-bound had to be able to grab-and-go to do location shoots. The pack and head suppliers responded to the market need and began to supply both.

Power Packs

The pack is the central control unit for the flash heads. Usually, three or four (or more) heads plug into the pack. Some packs parcel out the power to heads much like an audio or video mixing console.

Power packs convert AC energy to DC using a transformer. The energy is then stored in a bank of capacitors, just as with a battery-operated flash. The only difference is that



the power pack needs to generate plenty of energy, so these electrical storage tanks can be quite large.

The voltage is in the 300 to 900 range. Sometimes it's more. As we regularly stress, this is plenty of power and it must be respected. Never attempt to service any part of the system yourself.

Another high-voltage system uses two banks of capacitors, one feeding the other as needed. Not needing a big transformer reduces weight.

A single brand of studio flash usually has a variety of power packs to choose from. They vary in power output. The less powerful one usually weighs less, too.

Some photographers have big power that they keep at the studio, and take the smaller, lighter packs with them on location.

Shooters who exclusively do portraits have no need for the industrial-strength power that some big packs offer. If you work with umbrellas and always shoot around

$f/5.6$ or $f/8$, you can save some money and some back strain, too.

However, if you shoot commercial photography and need $f/22$ from a large light bank, you have no choice but to get what the big boys use.

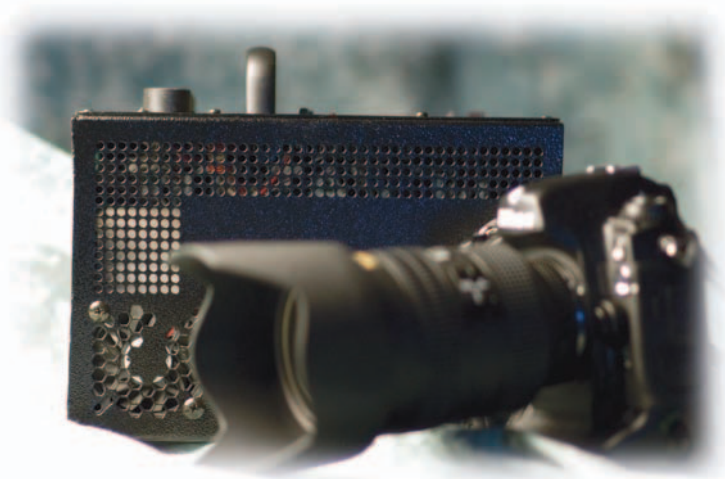
The packs are often rated in watt-seconds. We'll explore that further on page 384.

Flash Heads

The energy from the power pack is delivered to the flash head, on demand.

The heart of the head is the flash tube where a brief gas discharge takes place. Photographers love the daylight Kelvin temperature of the flash head.

The often incomplete doughnut-shaped quartz glass flash tube is filled with a xenon gas with electrodes on either side of it. When a triggering electrode applies a pulse, it ionizes a gas path. The capacitor's voltage is then discharged and the bright light is emitted.



Size and weight are considerable factors when choosing a brand of flash lighting. Above is a top-of-the-line Nikon camera, with a significant lens on it, parked in front of Novatron's largest power pack, the one to the left, under a Mac laptop.

Flash heads, like power packs, usually come in various shapes and sizes. Some brands have some smaller units with a built-in reflector to keep things compact. Other manufacturers have designed flash heads with more than one flash tube for their huge power packs.



We shoot exclusively with fan-cooled bare tube flash heads. We get deeper into the reasons for this on page 392.

Modeling Light

Photographers want to visualize what they are going to see when the flash fires. To assist with this, the flash head includes a modeling light. These are often in the 250-watt range and are nestled in the center of the flash tube's doughnut shape, in an effort to provide some resemblance to the light that the flash will create.

The modeling light should have a similar effect with the reflector, umbrella, light bank, or other accessories as will be seen by the flash tube.

Additionally, the modeling light creates its own ambient illumination. This prevents the human subjects from having dilated pupils when the flash fires.

Modeling lamps should remain at constant levels. For some reason, there are brands of flash systems that have the modeling lamp go out after the flash fires. Some feel that the bright light of the flash, followed by a second or more



of total darkness, is not a good idea for the subject's eyes. Others feel that the darkness makes children uncomfortable.

The Monolight Advantage

Monolights have some pluses over the pack and head route. They are pretty much a power pack and flash head fused together as one. You now have something of a flash head with all of the power pack's controls on the back of it. A few of the reasons that we hear from photographers who love them include:

- They set up and strike fast.
- There are no cables running from the power pack to the flash heads.
- Just toss one or two of them in a case, grab some support, and you're ready to go.
- There's no need to share power with other flash heads.

The Monolight Downside

The minus column for the Monolight lists such things as:

- When you need to buy another light source, it's more expensive than a flash head.
- The controls of the monolight are not sitting next to the photographer. If the monolight is on a boom, it's tough to get to, unless there's a remote control, which is another expense.
- They weigh more than a flash head, making a setup more top-heavy.

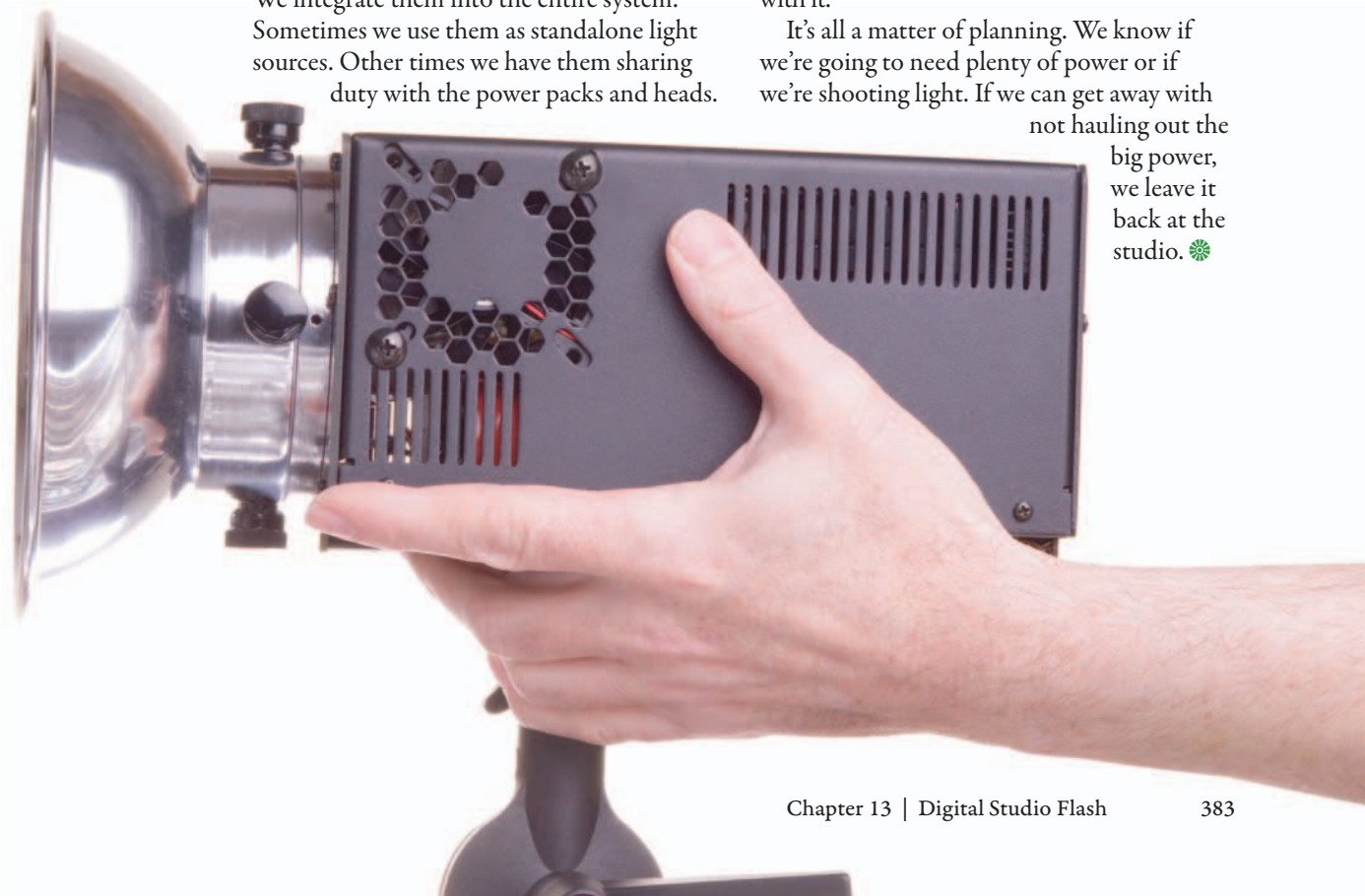
- They're not available with the kind of big light output that high-end power packs offer, preventing a big burst of illumination from a single light source.

Our Take on Monolights

We integrate them into the entire system. Sometimes we use them as standalone light sources. Other times we have them sharing duty with the power packs and heads.

If a photographer already has a power pack or two and a few flash heads, adding a monolight or two is a great way to expand a system. They all should share the same accessories, so once you have gotten into one part of a system, everything from that same brand ought to work with it.

It's all a matter of planning. We know if we're going to need plenty of power or if we're shooting light. If we can get away with not hauling out the big power, we leave it back at the studio. 🌿



What's a Watt-Second?

There's some unique jargon used in relationship to AC flash. Sometimes it does not make sense. Maybe the problem isn't with you. Maybe it has everything to do with how the terminology is used.

Watt-Second?

You'll hear photographers and the professional photo retailers use the term "watt-second" to describe the power of their flash systems.

When the utility company bills you for the electricity that you have used, they tell you that you have consumed X number of kilowatt-hours this month.

A watt-second is simply a smaller unit of the kilowatt-hour. It's an expression of the electrical power that the flash unit consumes.

So what?

That's a good question.

Why's This Useful Math?

The reason this has become useful is because it helps you do some simple math. If you now own a 250 watt-second (Ws) power pack and it's giving you $f/8$ in a setup that you use regularly, and you wish you could have one more f-stop, then double the watt-seconds and add a 500 Ws pack to your wish list. In the exact

same setup, if you swapped a 250 Ws pack for a 500, you'd have $f/11$. If you need $f/16$, you guessed it, go for a 1,000 watt-second unit. If $f/22$ makes your heart sing, prepare to shell out a few dollars for the big 2,000 watt-second pack.

How else do you get more power? Get two power packs.

When Watt-Seconds Don't Work

That seemed simple enough, but it becomes confusing when you're trying to compare brand A with brand B.

Just because you have a very compact 1,000 watt-second power pack that's faithfully providing $f/16$, won't another 1,000 Ws pack from another brand also give you $f/16$? Chances are pretty small that you'll find that to be true.

All brands of power packs are engineered differently. They work at different voltages. Some use smaller more efficient flash heads. Others know that the end user needs a bigger flash head crammed with a bigger flash tube.

Some power packs practically come up to your knee, but may produce less light than the one you can hold in your hand.

Does that mean the big unit is poorly designed? It might, but it might not. The brand of that bigger pack just consumes more watt-seconds so it has a bigger number.

A few older style power packs, like the one below, still use watt-seconds on their control panels. Some photographers like that.

You need to become an informed consumer. Visit your professional photo retailer and do some testing with a good light meter. That should tell you all you need to know. ☀



Light Output in Digital Increments

One of the many great joys of flash lighting in a digital environment is that once you have purchased your equipment, you can forget the whole watt-second thing until you need to expand your system.

Tenth-Stop Increments

Today, many digital flash systems work with something that we photographers know: the f-stop.

You can digitally adjust these power packs and monolights in increments of just a tenth of a stop. It's completely accurate and it's completely repeatable, day after day.

Not all brands have entered the digital environment. As your mother may have told you, "Don't play with them."

A great place to get started, with digital flash, is just one flash unit. That might be just one power pack and one flash head or it could be a monolight.

The Novatron 1,000 and 1,500 watt-second power packs allows you to adjust the light output over a 5.7 f-stop range, in tenth-stop increments. That means there are

fifty-eight possible power level settings running from full power to -5.7 f-stops.

At full power, with a 600 watt-second monolight eight feet from the subject, if your flash meter measured $f/22$, you could adjust the full-stop light output as follows:

Full	600 Ws.....	$f/22$
-1.0 stop	300 Ws.....	$f/16$
-2.0 stops	150 Ws.....	$f/11$
-3.0 stops	.75 Ws.....	$f/8.0$
-4.0 stops	.375 Ws.....	$f/5.6$
-5.0 stops	.19 Ws.....	$f/4.0$
-6.0 stops	.95 Ws.....	$f/2.8$

The amount of light that falls on a subject depends on many factors, such as the size of the space, the color of surrounding surfaces and their texture, the height of the ceiling, and so on. The numbers in our 600 watt-second sample are based on a monolight that is no longer in

production but it is an excellent representative of how digital studio flash works.

As you make these adjustments your options change the LED display reading things like: -1.1, -1.2, -1.3, -1.4, and so on. These match your flash meter's readings of $f/11.9$, $f/11.8$, $f/11.7$, $f/11.6$, and so on.

These packs are easy to adjust. Increase the output in by pressing the "up" button once, or hold down that button to fly through the complete increased output range until you get to "Full."

Decrease output in the same way with the "down" button.

After you have selected the power you want, press the control panel's test button to fire the flash head once, and your setting is locked-in. 🌸



Sync Cables and Going Wireless

When you press your camera's shutter release button, the flash must fire in synchronization with the lens's aperture and shutter.

It used to be that photographers were tethered to the power pack or monolight through a sync cable. Around 15' long, the sync cable runs from the power source to your camera's flash sync terminal. If your camera doesn't have such a terminal, there's probably an adapter that slips into the accessory shoe intended for the on-camera flash unit.

On the opposite side of the sync cable, flash brands differ. There's the traditional "household" (named for its similarity to a household A/C wall outlet) and the "phone" (which takes its name from the audio plug used for microphones and headsets).

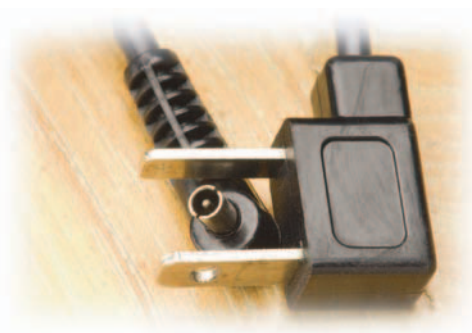
Sync Cable Caution

Please be careful that no one plugs your sync cable into an AC wall outlet. Don't allow children to play with these cables.

Reverse the Polarity

Sometimes a sync cable doesn't allow the system to fire. Chances are good that there's nothing wrong with it.

Flip the household side 180° so that the prong that was on the right is now on the left. Try it again. It may fire now.



Going Wireless

As with most things, wires are a thing of the past. Many professional photographers gave up on sync cables a long time ago.

The cable between the camera and the flash generator can be dangerous. If someone trips over the cable, the camera can be pulled from your hand or the tripod that's holding it toppled to the ground.

Photographers prefer a digital wireless flash and camera trigger. It's a very simple yet necessary system.

The Transmitter

On the camera side, once the shutter is released, a signal must be sent to the flash generator. Just like attaching the sync cable to your camera, a short wire needs to run from the camera's flash sync terminal to the transmitting device.

So that it transmits flawlessly, our Quantum FreeXWire needs a unique channel code. Just flip at least one channel switch up on the back panel.

You can mount the transmitter on a power bracket or tripod.

Many photographers prefer to use an optional hot shoe adapter, which does away with the wires, placing the transmitter on top of the camera. Quantum provides this free of charge when you register.



The receiver side of the Quantum FreeXWire system plugs into the light generator. With multiple transmitters, one camera can fire many light sources.



The Receivers

Set the receiver to the same channel as the transmitter and run a sync cable from the receiver to the flash generator.

Here's where it gets even more fun. We shoot with plenty of power. We often need to hot-wire one power pack to another.

Skip that.

Add an extra receiver. As long as it's on the same channel, the transmitter triggers two packs or monolights simultaneously.

Great for Multiple Photographers

We have shot more than one project in studio at a time. This makes traditional slave units



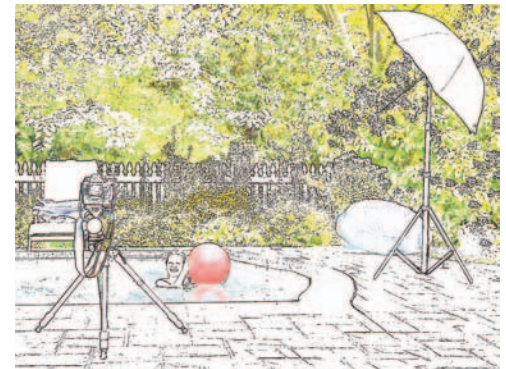
Quantum's FreeXWire transmitter plugs into the camera's sync outlet and straps to the tripod. Should your camera not have a sync outlet, it's available as an accessory that slides into your camera's hot shoe.

impossible. When one photographer's flash fires, the other shooter's fires, too.

This is made worse for those who cover events where many flashes are going off simultaneously, such as weddings, sports, and news stories.

We often shoot with two photographers who are making images at the same time. We have worked with as many as four at a time.

If everyone is set to a separate channel combination, they all work independently. Though there are just four switches plus the local, this creates quite a few combinations. 🌸



Wireless is perfect for shots like the one on this chapter's divider (pages 378 & 379). The fewer wires on a set, the safer it is for everyone.

Recycling Time vs. Power Output

A flash unit is fully recycled when the capacitors that hold the energy have been completely restored.

Usually, a single burst of light only consumes a small portion of the available energy. While the “caps” are being recharged, the photographer can continue to knock out image after image. During this time, the recycling is happening in the background unnoticed by the shooter.

Minimal Power = Fast Recycle

When a small portion of the energy is consumed, the recycling procedure happens quickly. If you set the unit to full power, you drain off plenty of the supply.

Minimal power output equals fast recycling. Big power usage results in slower recycling times.

Recycling and Local Conditions

Your line voltage can vary based on what the local utility company is delivering and the power constraints of where you’re shooting. Local conditions can result in faster or slower recycle times.

How Fast?

Under good power supply conditions with a well-engineered power generator, something like this would be typical:

Full	2.00 seconds
–0.5 stop	1.00 second
–1.0 stop	0.80 second
–2.0 stops	0.50 second
–3.0 stops	0.25 second
–4.0 stops	0.20 second
–5.0 stops	0.15 second
–6.0 stops	0.15 second

Admittedly, these are more impressive numbers than we see with most AC flash sources. Keep that in mind. This is not the norm. Full recycling in 2 seconds is not usual, especially with older units.

Practical Application

How do you apply this to your day-to-day photographic needs? If you shoot tabletop photography, you probably

could care less. The still life that you shoot isn’t going anywhere in the next 2 seconds. You can go full power in one shot and shoot the next one in a couple seconds later.

Should you be an action people shooter, you have other needs.

You have to ask yourself how quickly you are shooting. Open a recent shoot’s unedited collection in Adobe Bridge. Check the time the image was made to the second. Are you shooting more than one image per second? If so, how many?

If you are regularly knocking out two per second, the data in the column to the left tells you that you need to shoot down two stops or less. Combine this with the data on page 385 and you get a sense for how much power that you need.



Manage Flash Duration

The Consequences

We have worked with some photographers who have just blown off the recycling time factor and shot as fast as they could.

What happens to them?

After a while, there is not sufficient power and the light output is compromised. The exposures are usually too dark to be usable.

Sooner or later, the flash generator usually overheats and the unit's circuit breaker blows. You have to wait a few minutes for it to cool down and the whole shoot goes on hold. Sometimes, no one notices that the flash has stopped firing and that portion of the shoot is lost. ❀



Isn't "flash" coupled with "duration" somewhat oxymoronic?

That flash of light happens so quickly. How can there be a time component to factor in?

Flash Duration in Shutter Speed Numbers

You are used to your camera's shutter speed settings. They might run from as long as a few seconds to maybe as fast as 1/8,000 of a second (0.000125).

When you are shooting hand-held, there can be camera blurs at 1/15, 1/30, or even 1/60 of a second.

Flash duration also varies with the power settings that you choose. In full mode, a Novatron monolight has a flash duration of 0.0068 of a second (1/147). As the power output is reduced, the flash duration lessens. At the minimum power setting (–6.0 stops), flash duration is only 0.0006 (1/1,668).

This is something that you must factor in when planning to capture an image where freezing motion is important.

Do you think that this is only for photographers who take pictures of bullets flying through space and time or a lightbulb bursting as it impacts the ground? Then you must not be in the business of photographing many children. We confess to losing more than one shot to short flash duration.

The Give and Take

Here's another example of needing to weigh your options.

To get a faster flash duration, you need to go for a smaller light output. When you have the power pack in full mode, the flash duration is the slowest. When there's the least power output, you have the best chance of freezing motion.

This concept can be deceptive.

The obvious response is that the more powerful the power pack, the more you can reduce the output and get a faster flash duration. However, most flash sources have engineering personalities of their own.

The most powerful power source that a brand sells may not provide the fastest flash duration. As products are engineered, new technology opportunities arise.

Unfortunately, the flash duration specifications are not always available from manufacturers. This can be frustrating.

To learn more, you may need to contact the manufacturer's technical assistance department to get the facts.

Many of these people are eager to help you with this sort of thing and more than happy to discuss the specs. ❀

Contrast Ratios

There are many ways that contrast ratios are handled on the hardware side. Every brand seems to have its own scheme.

For many, the power pack is the sole command center. There's nothing to do on the flash head.

The Symmetrical Ratio

When a 1,000 watt-second power pack is at full operation, if there's just one flash head in use, all 1,000 watt-seconds are sent to that singular head.

If a second flash head comes to the party, now 1,000 Ws is evenly distributed to both flash heads. Each of them gets 500 Ws.

If this is for a key light and one fill light, that might not be ideal if they are equal distance to the subject with identical light modifiers. However, if the key is in a medium silver zebra umbrella and the fill light fires into a large white umbrella, everything is fine.

At the hardware level, the light ratio is 1:1. It's in symmetrical ratio before the light modifiers get their hands on it.

Asymmetrical Ratios

Often, that's not good enough for some photographers. They want to send so much

power to this flash head and so much less to that one.

This is often dealt with on the power pack, or is not addressed at all.

Novatron has had a unique approach. They alter light ratios on the flash heads.

What they call a “three-way switching head” permits light to be used at full power, down 1-stop, or down 2-stops.

One head in the system has to be at full power or problems can occur with the flash head's circuitry.

Modeling Light Ratios

You want to be able to visualize that same ratio with your modeling light. The flash heads provide the same switching to do that.

When you reduce the flash power by one stop, reduce the modeling

light by one stop as well. This is “tracking” in its most simple terms.

See pages 398 & 399 on how tracking works on a monolight. Some manufacturer's power packs have this cool trick, too. 🌀



Quartz Modeling Lamp

The quartz modeling lamp is one of the great underappreciated heroes of flash illumination.

It reduces red-eye by keeping the pupils open properly. Dilated pupils always make the subjects look like they are doing drugs.

Too Much of a Good Thing

At times, the modeling light can work against you, depending on its output.

If you have chosen a very low flash power, the modeling light can be so intense that it is no longer about the flash and is more about the modeling light. Instead of a lean 5,500 K, for which you have set your camera's white balance, your primary light source is the 3,400 K of the 250-watt modeling lamp.

In this case, use the modeling lamp reduction switch on the back of the flash head to reduce the incandescent light pollution.

Monolight Modeling Light

Because monolights live a solitary existence, unlike the flash heads that share a power pack home base, they need a means of providing a previsualization when used with other monolights or in conjunction with a pack and head system.

As it's not a perfect union of equals when you join one 600 watt-second monolight

with four flash heads on a 1,000 watt-second power pack, we have to be glad for what we have and live with it.

Here's the problem: at 1,000 Ws, even with one flash head, both the 1,000 Ws head and the 600 Ws Monolight provide you with 250 watts of modeling light. To your eye, it appears as if the two light sources are equally balanced. However, they are practically a full stop difference in flash power. You don't get a sense from the modeling light as to what the entire scene will look like when the flash fires.

Video Use?

Some photographers report that they have used the modeling light on their flash heads as a low-cost resource for occasional video lighting. This says something about the power of 250 watts. We have not heard from any professional videographers looking at this as a solution.

Frosted or Clear

Modeling lights come with all sorts of base sizes. Some have the same base as a household lamp; others have a more unique base.

The lamps come frosted or clear. We depend on the manufacturers' testing

that the modeling lamp provides the best representation of how the scene will appear when the flash fires.

Replacements

We have heard from photographers looking for an inexpensive route to replace their burnt-out modeling lamps. That's possibly a dangerous solution. The exact size, shape, and heat endurance of the modeling lamp was considered when the light source was designed. A great deal of engineering expertise went into selecting the best lamp.

Play it safe and choose the proper replacement lamp. 🌸



The Flexible Bare Tube

The bare tube head is our AC flash source of choice. For years we just had flash heads with built-in reflectors, but nothing compares to the flexibility of the bare tube. We like to have as many options available to us as possible.

Bare Tube vs. Built-in Reflector

Some argue that a flash head with a built-in reflector has a little more efficiency to it, and we concede that point, but it's a tenth of a stop or so.



The built-in reflector crowd likes having a few less setup steps. Some lighting manufacturers have slightly smaller flash heads when you choose the permanently attached reflector. However, if you need barn doors, snoots, grids, and other accessories, you can't interchange them with the larger flash heads.

Many of these ready-to-go flash heads do not offer fan cooling. These heads are supposedly designed for convection cooling, but that makes us a little uncomfortable about putting them in a confined space such as a light bank.

Because heat is a factor, these heads are often designed for use with lower-wattage modeling lamps. Some are intended to be used with only 100 watts. For us, that's just not enough light.

Plug-in Flash Tubes

Some flash heads have the flash tube soldered into the head. If the tube breaks, it needs to go to a repair station.

Flash tubes do not burn out. However, as photography is an on-the-go sort of business, accidents happen. Being able to pull out one flash tube assembly and pop in another is the



best solution. Professional photographers either bring an extra flash head with them or pack a spare flash tube.

The flash tube is an amazing design and engineering feat. The flash tube is within a rugged glass cover. If the assembly encounters any impact damage, there's a chance that the outer cover will protect the flash tube.

The flash tube assembly is quite durable and color-corrected with a UV coating. This helps it provide you with 5,500 K.

If you look carefully at the flash tube's incomplete ring, the part of the ring that does not come together at the top goes on the top of the flash head. If you ever need to unplug the flash tube, play it safe. As a precaution, unplug the flash head from the pack or the monolight from the wall outlet first.

Making Connections

Many professional photographers and assistants "hot patch" flash heads. They plug them into a power pack that's on.

In theory, this should be safe. However, we have heard too many war stories of how electricity has arced across the contacts when this happened.

That would be frightening to witness, knowing how many volts of power is involved. Never plug or unplug a flash head

while the power pack is on. It only takes a few seconds to turn the pack off, make changes and turn it on again.

Reflectors

We get into this in great depth on the next two pages. But let us add these words of cau-

tion. Many photographers secure the reflector to the flash head with two thumb screws. Plenty of reflectors are designed for that. However, many bare tubes are designed for up to four thumb screws to be used. Use all of them. Yes, it takes a few extra seconds, but the safety is worth it.

We never encourage anyone to modify their equipment, but if the flash head provides for four thumb screw attachments and you have an older reflector that has only two openings, think about carefully drilling two extra holes in it.

The Perfect Light Bank Companion

The best match for a light bank is a bare tube head. Just like the bare tube receives a reflector, it attaches to a light bank's speed ring.

If you have not yet read pages 276 & 277 on speed rings, you'll want to check back there, to see how easy it is to attach the head.

Balancing and the Bracket

The bare tube head and most monolights are from the same family and share many of the same body features. We cover the use of the bracket and how to balance the lighting instrument on pages 398 & 399. 🌟



Reflector Options

The ability to adapt your bare tube head to have various light qualities by simply popping off one reflector and attaching another is one of the great benefits of this flash head.

Good designers carefully craft their reflectors with computer-aided software tools to perfect the shape and surface to provide the most efficient use of the flash tube. The goal is to provide the same illumination in the center of the beam that there is close to the edge of it before the light falls off.

Test this in your professional photo retailer's showroom. Take a meter reading with the meter's dome facing directly into the path of the light. Take another one a couple feet to the right. Try a reading a few more feet to the right. Are the readings the same? As long as

the test space is free and clear of obstructions, they should not vary.

Reflector Types

Admittedly, one of the weak points of the Novatron system is its very limited family of reflectors. There are only two.

This is not a high-demand product, unfortunately. It seems as if many professional photographers have not discovered what reflectors can do. They're happy with the one that comes with bare tube or they're just not aware of their options.

The 6.5" reflector that comes with the Novatron bare tubes and monolights easily removes. There are four screw pins spaced evenly around the reflector. Just loosen them up a bit and then twist the reflector counterclockwise (as you're looking into the reflector) and pull it toward you. It has a polished surface for maximum efficiency.

Their 16" pan reflector is great for a broader, softer light. It renders the subject sharp, but not with any pronounced highlights. The surface is purposefully dulled. We like using this with diffusion frames.



What More Could You Want?

Two doesn't do it for us. Some other flash systems offer a narrow beam reflector. That confines the light to around 30°. The pool of light is quite concentrated and great for low-key lighting. Because the beam is tight, it's very efficient use of light.

On the other side of the coin is a reflector that provides a super soft flood of light, to 120° with a white surface and a reflector that covers the flash tube and bounces the light back to the reflector. 🌸



The Slave Eye

If you have more than one flash generator, you need a slave trigger.

On the Power Pack

This very simple, inexpensive electronic marvel fires one flash source when it sees the other flash fire. It's all as simultaneous as your camera's eye can detect.

Just plug the little slave trigger into the second pack's port for the sync cable. First test-fire the main pack and watch to see whether the slaved unit fires, too. If not, you

may need to reverse the polarity of the slave. Just unplug it, flip it around 180°, and test-fire it again.

These things have a pretty long range. If it still isn't firing, the slave may need to be placed more in sight of the main flash source.

With the Monolight

It is usually assumed by monolight designers that their self-contained flash units will be enslaved to other flash sources at more than one time in their lives. They usually have built-in trigger slaves, as do some power packs.

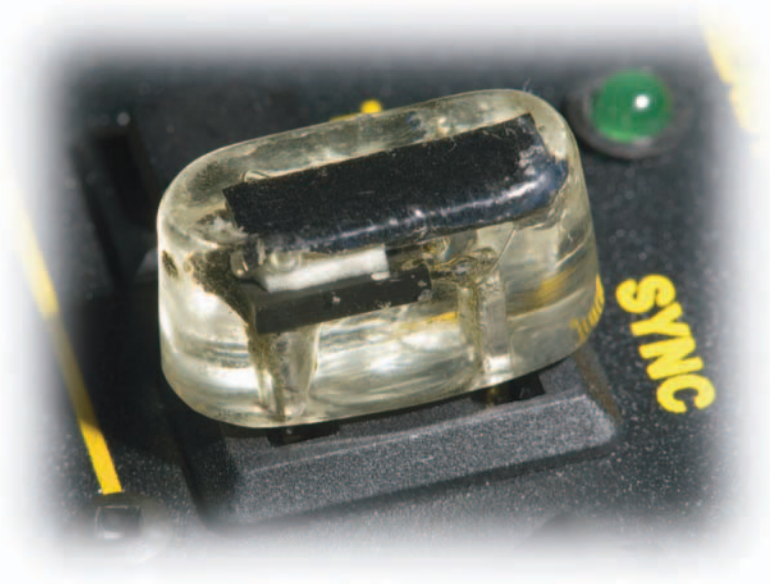
As great as it is to have on-board slave capabilities, it can be an annoyance, too, if someone else's flash is triggering your flash sources.

Turn the built-in slave off and on with the "slave" button. On

a Novatron, when you press the slave button, the LED responds with either "Son" or "SoFF."



These slaves are a must-have for photographers who build a whole system of just monolights. The first flash is the key light and the second one provides fill illumination. Another one can light a background. A fourth flash might add dramatic highlights to the back of the subject (such as a hair light on a portrait, which really pops out the three-dimensional look). 🌸



Copying Flat Art

We once owned what's known as a "production studio." We'd open our doors, at 8:30 a.m., Monday through Friday, and a flow of commercial work would come tumbling in from off the street.

Some of the needs seemed quite basic, but they came with a fair number of challenges.

Subjects Under Glass

People would bring us some unruly "flat art" that would not lie as flat, as its name implied.

Our response was to place it under a heavy piece of plate glass.

To the photographer unfamiliar with that technique, it seems like we made the difficult even worse. Now we have the reflection of the glass to deal with.

With the camera directly over the flat art, and all the lights off, except two on either side of the art, we made the reflections disappear. One of the two tricks has to do with using the polarizing filters that we discussed on page 295. The other trick puts into practice the angles of incidence and reflection that we explored on page 28, which we'll recap here.

Light Angle in Copying

If you place a glossy piece of paper on the wall and perfectly line up your camera so that you are pointing right at it, you have won only

a portion of the battle. The war with reflection will be lost if you light this with a single source of illumination from above the camera. The light will be projected from the single light source, strike the glossy surface, and return to the camera an excellent mirrored image of your light, making a big white glitch.

Two Is Better than One

The best way to light flat art is to apply your knowledge of the angle of incidence equaling the angle of reflection.

If your light sources are at a 45° angle to the art, the light comes to it, illuminates the surface, reflects off at the opposite 45° angle, and you're free of reflection. Use two light sources and place them equidistant to the art.

Make sure that your light is even. If it's not, you will be unable to faithfully reproduce the artwork. To assure an overall evenness, take five meter readings to be sure that your setup is on the money. Measure light in the center of the art as well as in each corner. If all five readings are not the same, adjust your lights until they're in harmony.

Wall Reflection

With these principles understood, fight one more possible battle that could prevent your success with this.

Experienced production photographers know that a white wall is not an ideal place to shoot copy art.

If you place a dark piece of flat art on a white wall and light it perfectly, it'll get a white buzz around it from the wall.

Place a gray card on the wall and carefully adhere your art to the gray card. Use the Lasto Lite 30" Ezy Balance Grey/White Card that we discussed on page 139.

The Right Light

This is not a job for a narrow-beam, polished reflector any more than it's a call for a pair of light banks. A tight light source is difficult to control. Using a softer illumination fails to provide the sharp image that you need.

We use Novatron's 16" Pan Reflectors for this, on a pair of bare tube heads.

When Four is Better than Two

Most professional copy setups come with four light sources. This prepares the workspace for larger pieces of art.

It's possible to get too much of a good thing. If you have even illumination with two lights, don't make you life more complex. It's easier to balance two lights than it is four. Sometimes two or more pools of light overlap, giving the copy area nasty hot spots. 🌞

Not much space is required for a basic copy setup. Angle your lighting instruments at approximately 45°, to reduce reflections.

Use polarizing filters, over the lights, if needed. We use the Novatron 16" Pan Reflectors for a broad light source that is neither too hard or too soft.

Avoid white wall flare-back by placing the flat art on a gray card.



Monolight Simplicity

For someone getting into AC flash, a good professional digital monolight is the perfect place to start. You won't outgrow it. No

matter how much your system grows, it will always fit in as an important component.

It's the start of an integrated system.

The monolight is an easy starting place. Add a flash meter, a stand, an umbrella, a light bank, and an interchangeable reflector panel and you have a little studio. (You might want to get a camera and a computer, too.)

Single Light Source

Start practicing with tabletop setups before you jump into people shots. See what the light can do.

Some of the examples on the following pages are a good place to start.

See how you can adapt the examples in a few of the daylight fluorescent and HMI chapters, too, along with those in the chapter on man-made modifiers.

A Quick Tour

Let's take a quick tour of some of the features that we have not yet covered on the Novatron monolights. They're very professional and the digital display makes it simple to adjust your exposure, as we covered on page 385.

Mounting Monolights and Bare Tube Heads

Powerful MonoLights have a little weight to them. Properly mounting them on a stand or boom is important.

Many of the products that we have been discussing in this book come with near identical brackets. They're extremely sturdy and versatile. After Westcott introduced them on their Spiderlites, Novatron started using them, in 2005, for their bare tube heads and M600 MonoLight. We have hung bare tube heads on them for days, supporting Chimera's largest light bank. The whole rig never drifted a fraction of an inch. The bracket attaches to a rugged brass stud at the base of the instrument. On the Novatron units, the screw tightens against a flat portion of the stud.

The segment of the bracket with the hole in it is for inserting the shaft of an umbrella. That's the bracket segment that installs closest to the lighting instrument's base.

This bracket's large lever, when loosened, allows the light to tilt up and down. When the lever is tightened, it's sturdy enough to resist freely tilting out of the locked position.

Once you have a secure mounting to a support, it's possible to gently open up the support-side bracket knob and swing the unit from side to side to refine the setup. Please



be careful when doing this, especially if your lighting instrument is now supporting the weight of an umbrella or a light bank. These get heavier than you think.

The Sliding Mount

A sliding mount moves the flash unit backwards and forwards on a stand or boom. This is important in balancing the weight of a large umbrella or light bank.

Audio Confirmation

Some photographers find it helpful to hear a confirmation that the monolight has fully recycled, that the monolight is having its power increased or decreased, that the modeling lamp mode is being changed, and so on. Pressing the audio button causes the LED panel to display “A on” if audio was just enabled or “AoFF” if you just disabled it.



Modeling Light Tracking

Some flash units offer three modeling lamp modes to assist you with the best shooting options. On some Novatron units one button cycles through all the modes. As you press the button, one mode at a time, the red, yellow, or green LED illuminates:

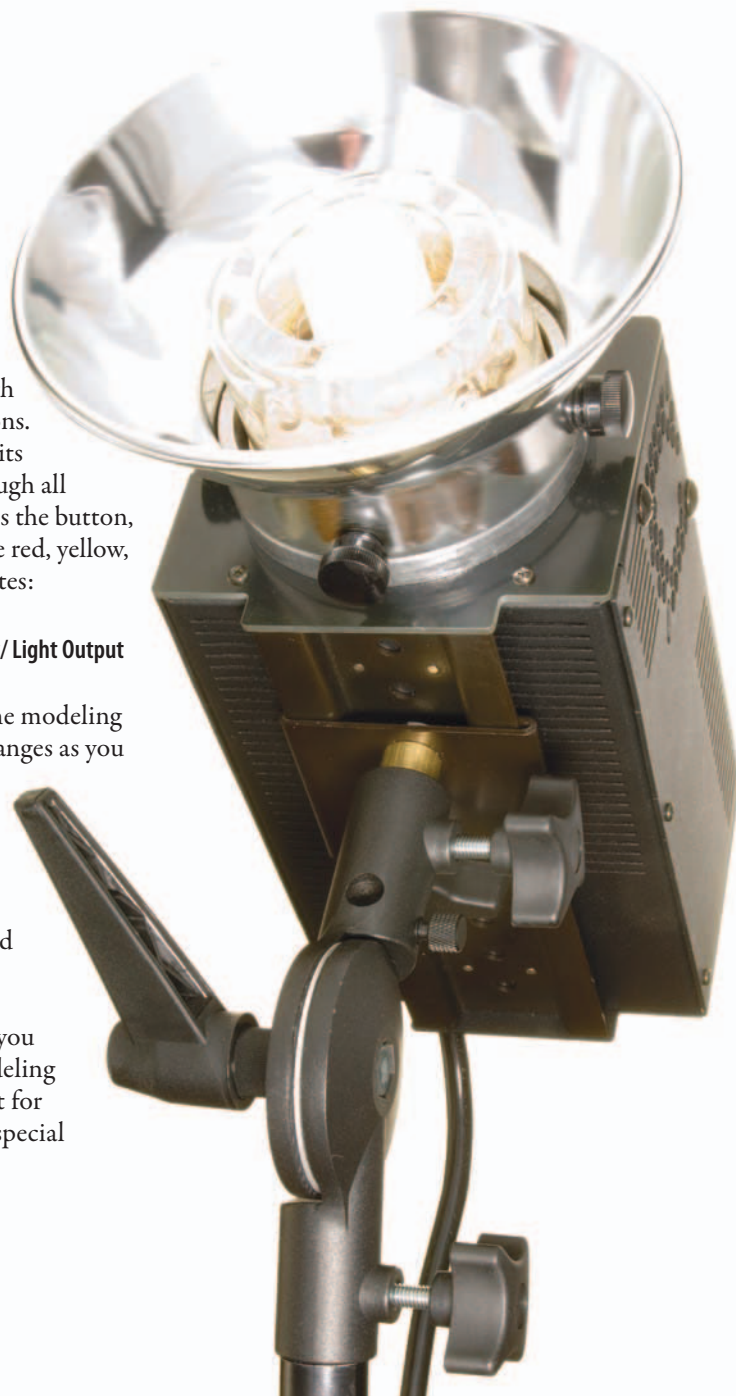
Green: Full 250 watts

Yellow: Tracking Varies w/ Light Output

Red: Modeling Lamp Off

In tracking mode, the modeling lamp's illumination changes as you raise or lower the light output. This is effective in visualizing the entire scene when using more than one identically powered monolight.

For some shots with longer shutter speeds, you may not want any modeling light at all. This is great for multiple exposures or special effects shots. ❁



One Light Source

There's both beauty and simplicity to working with just one light. It mimics our natural light source.

If the one light is large enough, it's a great workspace for the talent. Though it's not as efficient as a smaller light source, a large umbrella of light bank fills a large space, so the models can move about freely.

The more energized the talent becomes, the more great shots we get. So a nice-sized working space is a big plus.

On Their Mark

We talk to our models about their "mark," the area they can work in. The more they understand about their light, the more they play to it. If we point out the area they have to stay in, they're very good about it. Many of the models we work with are actors and are used to the term "downstage," meaning the area closest to the camera, as opposed to "upstage," which is the background.

Just about everyone we've worked with has been anxious to please. They take direction well and we have a great deal of fun.

Measuring Light Fall-Off

Of course, there's a limit as to how large the talent's workspace can become. The light's fall-off dictates that.

Meter the talent's work area so you know the limitations. Holding to a half-stop change from center to edge works for us in most circumstances. However, there is no hard and fast rule. Every lighting setup is different. Often, you can use fall-off areas to keep some talent upstage. With less light on the background talent, the downstage talent becomes the focus of attention.

Talent Direction and Light Quality

Our young models to the right, Morganne and David, are excellent examples of talent well-versed in the acting world. We give them a little direction and they jump into it, get into character, and play the part.

These characters that they play permit them to have some fun and step away from their real selves. It creates a good comfort level for them and we get the emotional responses that work.

We were shooting in a conservatory and had the appearance of being outdoors. With glass all around us, there was plenty of ambient light. The one large umbrella created a soft enough illumination to fill in some shadow areas. Using a reflector assisted in kicking back some of the natural light, acting as a fill light source. Some would be bothered by the shadows between them. It was our intent. 🌸

Tech Specs

Photographer

Brian Stoppee

Stylist

Sherrie Hagan

Illustrator

Janet Stoppee

Camera

Nikon D2x - ISO: 100 • Shutter Speed: 1/125
Manual Mode

Lens

AF-S VR Zoom-Nikkor 70-200mm f/2.8G IF-ED @ 180mm
35mm Focal Length: 270mm @ f/5.6

Lighting

1 - Novatron 1,000 Ws Digital Power Pack
1 - Novatron Bare Tube Head w/6.5" Reflector
1 - Westcott 45" Silver/Black Backing Umbrella

Light Meter

Gossen Starlite

Support

1 - Gitzo Mountaineer Tripod
1 - Gitzo Off-Center Ball Head
1 - Matthews 40" C Stand w/Sliding Leg

Software

Adobe Bridge, Camera Raw, and Photoshop
Corel Painter

Talent

Morganne Wilbourne
David Wilbourne



Panel Frames for Floods of Light

Another way to produce a great deal of light in a large workspace is the panel frame.

The Benefits

Once the frame is erected, multiple light units can be placed behind it to boost power output. This is a very different light source than a light bank or an umbrella. It affords the opportunity to use many different fabrics, to determine the degree of diffusion.

The Downside

A light bank diffuses the light source using its back and side shape plus up to two diffusion fabrics before the light emerges. This is a very soft illumination. The umbrella takes advantage of its parabolic shape to diffuse light.

The frame has none of those advantages.

The Setup

To make the most of a diffusion frame you need to know the source of the light.

For our shot, we have two monolights with 6.5" reflectors, one for each of the two photographers. We are attempting to illuminate fully the billiard table with fairly even light all around. Work with your angle of light. Determine the best distance from your flash head to the diffusion material. Consider wider reflectors.

The even light wrapped around Sherrie speaks for the illumination quality. It flaunts the beautiful contours of her face and arms, keeping the highlights and shadows soft. 🌸



A diffusion frame provides soft, even illumination spread over a broad area, permitting numerous light sources for extra power. Adjust your flash head's distance and fabric quality for the desired results.

Tech Specs

Photographer

Brian Stoppee

Stylist

Sherrie Hagan

Illustrator

Janet Stoppee

Camera

Nikon D2x - ISO: 100 • Shutter Speed: 1/250
Manual Mode

Lens

AF-S VR Zoom-Nikkor 70-200mm f/2.8G IF-ED @ 70mm
35mm Focal Length: 105mm @ f/9.0

Lighting

1 - Novatron M600 MonoLight
1 - Chimera Panel Frame - Large w/ Scrim Material

Light Meter

Gossen Starlite

Support

1 - Gitzo Mountaineer Tripod
1 - Off-Center Ball Head
1 - Matthews Preemie Baby Stand
2 - Matthews Hollywood - 2-1/2" Grip Heads
2 - Novatron Heavy Duty Stands

Software

Adobe Bridge, Camera Raw, and Photoshop
Corel Painter

Talent

Sherrie Hagan



Create Sunlight

Making a unique space really pop takes some ingenuity. This is where you need to get clever with your lighting design.

General Illumination

To fill a renovated attic office space with light, we had to inundate the room with an overall illumination. A light bank was an easy choice for this. Its light output, however, is only one of four considerations we must factor in.

Incandescent and Natural Light

Two factors over which we have little control are how much light is naturally streaming through the windows and the overhead lights in the main room plus the track lighting in the room behind it.

We make the most of them by planning to make an extended exposure. We take ambient meter readings without the light bank to determine the length of our shutter speed.

Artificial Sunlight

To add some drama we placed a flash head with a 16" pan reflector on a boom arm, stretched

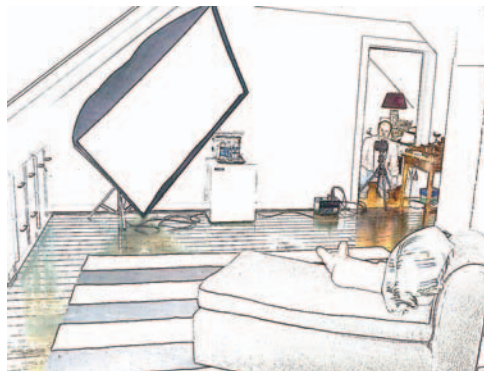


out over the roof, flooding light in through the dormers.

This side light appears as if the sun is rising through the dormers.

Filter Enhancements?

We tested this with golden filters, which had a beautiful effect. However, the color took on the role of a major player in the photo. If this image were not intended for sales material about the property, we would have stuck with the colored filters. However, this was a story about the room and not our creative interpretations. The image's end use gets priority. 🌻



To create some lighting drama, drag the shutter to pick up the natural illumination, use a light bank for general lighting, and project light in, from outside..

Tech Specs

Photographer

Brian Stoppee

Stylist

Tracey Lee

Illustrator

Janet Stoppee

Camera

Nikon D2x - ISO: 100 • Shutter Speed: 1/13
Manual Mode

Lens

AF-S DX Zoom-Nikkor 18-70mm f/3.5-4.5G IF-ED @ 18mm
35mm Focal Length: 27mm @ f/6.3

Lighting

2 - Novatron 1500 Ws Digital Power Packs (1-w/slave)
2 - Novatron Bare Tube Heads (1-w/16" Pan Reflector)
1 - Chimera Novatron Bare Tube Quick Release Speed Ring
1 - Chimera 54" x 72" Super Pro Plus - White

Light Meter

Gossen Starlite

Support

1 - Gitzo Explorer Tripod
1 - Gitzo Off-Center Ball Head
1 - Matthews Premie Baby Stand
1 - Matthews Magic Stand
1 - Matthews Boa Bag - 15lbs.

Software

Adobe Bridge, Camera Raw, and Photoshop
Corel Painter



Glamour Lighting

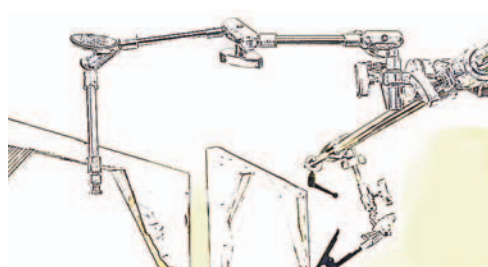
Many photographers create some gorgeous tributes to the human form. Their creations go back many centuries to the masters of canvas and oil on exhibit everywhere from the world's most renowned museums to the collections of the Vatican.

The image to the right is the one and only glamour shot that our studio has done this century. It's just not our thing.

Proper Decorum

Heather, a dedicated wife and mother, is one of our all-time favorite models, with ties to our studio since she was a teenager. As you can see from the illustration, she wore a towel until we did the shoot, never exposing herself to us.

We want our talent to feel very comfortable and dignified. That's important to us.



The Matthews Matthellini Clamp and Baby Extendable Offset Arm support the background.

Glamour Light?

We're hard pressed to define glamour light. Is it a soft, flattering illumination? Is it just an appropriate light for the subject?

The late great Mike Pocklington conceived the lighting for this shot, testing Rosco diffusion materials and the exact light positioning for the shot. He chose Rosco Tough Frost to be placed over a bare tube head.

The light softly caresses Heather's torso, making a long transition from the highlight across her abdomen to the neutral area on her side and then into a soft shadow.

A reflector kicks back just the right amount of illumination to further soften the shadows.

Set Decor

The stylist, Tracey Lee, who once owned a modeling agency that represented Heather, created the two backdrop panels with the leading scenic paint in the theatrical industry, Rosco's Iddings Deep Colors. This casein-based paint requires very small quantities to create some very alive color. It's the ultimate



choice for the painters of awesome, award-winning scenery for Broadway.

All of it is held in place with Matthews support equipment, as we covered in Chapter 9, "Creative Support and Safety."

Testing

This is not a shoot that you knock-out in seconds. It takes a great deal of testing.

First we shot images with stand-in to be sure that we had the lighting and model positioning optimized. After checking the test shots, we brought in Heather, after making tedious adjustments. Angling her face and body as well as the reflector made the shot work. The light had to shield her face to some degree, to provide a feeling that you are peeking into a private moment. 🌸



Positioning the light and talent cannot be stressed enough for a successful glamour shot.

Tech Specs

Photographer

Brian Stoppee

Stylist/Back Drop Artist

Tracey Lee

Illustrator

Janet Stoppee

Camera

Nikon D2x - ISO: 100 • Shutter Speed: 1/250
Manual Mode

Lens

AF-S Zoom-Nikkor 28-70mm f/2.8 IF-ED @ 60mm
35mm Focal Length: 90mm @ f/11

Lighting

1 - Novatron 1,000 Ws Digital Power Pack
1 - Novatron Bare Tube Head (no reflector)
1 - Rosco Tough Frost
1 - Westcott 42" Gold Illuminator

Light Meter

Gossen Starlite

Support

1 - Manfrotto Tripod with Quick Release Head
1 - Novatron Heavy Duty Stand
1 - Matthews Mini Preemie Baby Stand
1 - Matthews Preemie Baby Stand
1 - Matthews Baby Boom
1 - Matthews Hollywood Baby Extendable Offset Arm
1 - Matthews Hollywood - 2-1/2" Grip Head
1 - Matthews Afflac Clamp
1 - Matthews Knuckle Head
1 - Matthews Matthellini Clamp - 3-inch Center Jaw

Software

Adobe Bridge, Camera Raw, and Photoshop
Corel Painter

Talent

Heather Williams



Multiple Umbrellas

This is quite an involved shoot, even for us, utilizing four light sources. However, it is not difficult. It's just three umbrellas, carefully focused, plus one light bouncing off the ceiling.

A total of 4,600 watt-seconds of very efficient power is in use. For some professional photographers, that's not much power at all. For us, it's unusually heavy, but was the minimum we needed to accomplish the task.

General Illumination

On a late winter's afternoon, in the lobby of an auditorium, we staged a shoot that has the trappings of what could be businesspeople making connections with each other.

The lighting is a delicate balance. We skipped the look of natural illumination coming through the French doors and went for an evening feeling, where the main light source comes from the interior. This is obvious in the highlights to the right and the soft shadows closest to the doors. The three umbrellas blow in a great deal of light, in even distances from each other with the two downstage light sources at 1,500 watt-seconds each, and the back umbrella at 1,000 Ws and the final bounce light with just 600 Ws. This caused the light to diminish as the scene's perspective retires into the background, punching out the downstage talent.

Direction

The following illustration shows more than how we light a scene. It reveals how we work.

Janet is shooting with a long lens at a distance from the talent. This limits the depth of field to the downstage side. The optical compression assists in our attention being drawn to the foreground talent. Janet is too far away to direct.

After styling the models, Sherrie directs the talent. She's closer to them and out of the view of the lens's angle.

Following a great styling session, the models have a bond with the talent coordinator and respond well to her direction. 🌸



To light a large space with varied light intensities can require plenty of power. Each of the four light sources are slaved together.

Tech Specs

Photographer/Illustrator

Janet Stoppee

Stylist/Talent Director

Sherrie Hagan

Camera

Nikon D2x - ISO: 100 • Shutter Speed: 1/250
Manual Mode

Lens

AF Zoom-Nikkor 80-400mm f/4.5-5.6D ED @ 130mm
35mm Focal Length: 195mm @ f/6.3

Lighting

- 1 - Novatron 1,500 Ws Digital Power Pack
- 2 - Novatron 1,000 Ws Digital Power Packs
- 1 - Novatron M600 MonoLight
- 3 - Novatron Bare Tube Flash Heads w/6.5" Reflectors
- 1 - Westcott 45" Gold/White Umbrella
- 2 - Westcott 45" Silver/White Umbrellas

Light Meter

Gossen Starlite

Support

- 1 - Gitzo Explorer Tripod
- 1 - Gitzo Off-Center Ball Head
- 1 - Matthews Baby Jr. Triple Riser Stand
- 1 - Matthews Baby Jr. Double Riser Stand
- 1 - Matthews 40" C Stand w/Sliding Leg
- 1 - Matthews Premie Baby Stand

Software

Adobe Bridge, Camera Raw, and Photoshop
Corel Painter

Talent

Joe Spagnolo
Michelle Shea
Nicholas Parsons
Bob Lindholm



Multiple Light Banks

How do you shoot a great cocktail?
Very, very carefully!

Two Soft Banks + Reflector

We need three light sources to make all this come together.

The Chimera Daylite Jr Plus - Extra Small light bank has the advantage. Due to its nimble size, it's more efficient. The Chimera 54" x 72" Super Pro Plus - Silver bank becomes the fill light, while the little guy is the key.

That's not enough. We need to toss in a reflector to bounce back additional fill light.

No one's idle on our shoots. Tracey Lee, the stylist, and cocktail fashion master, with an ear and taste bud for the latest trends, plus experience with the age-old tradition of bartending, holds a 14" Westcott Illuminator on the silver side to add dimension.

Styling and Lighting the Feeling

A cocktail is a cold delight. We pull no punches. We have no special effects. It's all natural. It's all the real deal.

Tracey didn't grease the glass and spray on beads of condensation. She does all her food styling just the way it is consumed. (This means we have quite a happy time at the end of food shoots!) This method requires her to prep everything to be delivered on the set at

the exact moment that it's needed and requires us to prep and test everything. By the time the subject arrives, we have seconds to make the shot. Everything needs to be in place.

This chilled enjoyment cannot be lit warm. It needs an on-the-money white-balanced light to make those clean beaded reflections have a look of purity.

The only warm element in the shot is the garnish. Its contrast allows it to take center stage.

Light Source Roles

The biggest contribution that our key light provides is a highlight on the garnish. This defines specularly: a mirror of the light source. That specular gives those three little orbs their feeling of dimension.

The size of the fill light explodes a much-needed overall illumination from

the left. The trick is to fill the space without over-illuminating the background. The dark marble must have less light in back than in the foreground for the cocktail to separate well. To some degree, the little reflector steals the fill light's thunder. It picks up all the lighting resources to build a terrific back light. ☼



A small key light provides the specular highlights while the larger fill light source handles the overall illumination. The little hand held reflector

works as a backlight, popping out the glass's dimensional qualities. The backlight pops out the backside of the glass, so it doesn't look flat.

Tech Specs

Photographer

Brian Stoppee

Stylist

Tracey Lee

Illustrator

Janet Stoppee

Camera

Nikon D2x - ISO: 100 • Shutter Speed: 1/250
Manual Mode

Lens

AF Micro-Nikkor 60mm f/2.8D
35mm Focal Length: 90mm @ f/5.6

Lighting

1 - Novatron 1,000 Ws Digital Power Pack
1 - Novatron M600 MonoLight
1 - Novatron Bare Tube Flash Head
1 - Chimera Daylite Jr Plus - Extra Small
1 - Chimera 54" x 72" Super Pro Plus - Silver
1 - Westcott 14" Silver/White Illuminator

Light Meter

Gossen Starlite

Support

1 - Gitzo Explorer Tripod
1 - Gitzo Off-Center Ball Head
1 - Matthews Premie Baby Stand
1 - Matthews mini Premie Baby Stand

Software

Adobe Bridge, Camera Raw, and Photoshop
Corel Painter



Assisting Natural Light

Please pardon our tongue-in-cheek expression of “assisting” the sunlight. However, on occasion, when the natural light cannot provide what’s needed, a little electronic flash has to come to the rescue.

Cautions on Artificial Key Light

This can be like volunteering to climb up a very slippery slope. Using artificial light as a fill is easier. It complements the key light, softening shadows.

When artificial illumination becomes your key light, you can run into problems of the flash looking unnatural.

At the same time that you are creating highlights, you are also building shadows. More shadows can go in a direction that opposes what the natural illumination is doing elsewhere in the frame. This further points to an unnatural light source.

What the Light Says

As you design your light, consider what you want the image to say.

In this shot, we want the look of a hot summer’s day about to be enjoyed by a cool experience on a gently flowing river.

A great way to visually express heat is to bring out the highlights on flesh tones. This can be attractive on a male subject but make

a less-than-flattering visual statement about a woman, especially when the female talent needs to appear joyful.

With this in mind, Ian is taking the heat. We have highlights on his forehead, cheek, nose, and ear. The highlights are on our female talent’s hair and back, providing her with an added dimensional quality.

Our camera positioning pops the couple out from the dark tones of the river behind them, so we focus our attention on Sherrie and Ian.

The Reverse Umbrella

We want a soft illumination. During the course of the day’s shoot, we’re going to be setting up and striking at various locations around this riverside estate.

Keeping the load light is an important consideration. Safety is another.

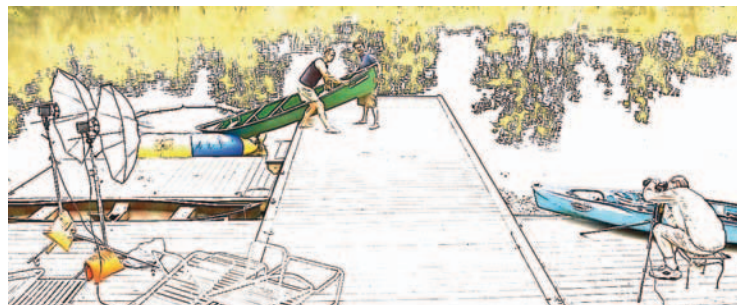
We chose to make our main light source umbrellas and provide as many variations as possible based on what fits.

By turning the umbrellas around and firing light through them, our light is not only softer but it also radiates over a large area. This ensures that our light is not focused in a tight area, appearing more unnatural.

Admittedly, this is not the most efficient use of our lighting output. However, it accomplishes our lighting needs.

Two photographers shoot simultaneously from different angles. Each photographer has one umbrella source, driven by a 1,500 watt-second Novatron power pack.

Properly weighting the light stands is even more essential when shooting outdoors 🌿



When using flash as your key light, take special precautions to keep the look as natural as possible. It could be best to flood an area with light as we did here by firing flash through a reversed umbrella. Take care to watch

for shadows that are going in a direction other than the natural light’s flow. Go for just a little more flash intensity than the ambient light.

The above illustration shows two umbrellas, one for each photographer.

Tech Specs

Photographer

Janet Stoppee

Stylist

Sherrie Hagan

Illustrator

Janet Stoppee

Camera

Nikon D2x - ISO: 100 • Shutter Speed: 1/125
Manual Mode

Lens

AF Zoom-Nikkor 80-400mm f/4.5-5.6D ED @ 160mm
35mm Focal Length: 240mm @ f/6.3

Lighting

1 - Novatron 1,500 Ws Digital Power Pack
1 - Novatron Bare Tube Flash Head
1 - Westcott 60" Optical White Satin Umbrella

Light Meter

Gossen Starlite

Support

1 - Gitzo Explorer Tripod
1 - Gitzo Off-Center Ball Head
1 - Matthews Baby Jr. Triple Riser Stand
1 - Matthews 25 lb. Water Repellant Sandbag

Software

Adobe Bridge, Camera Raw, and Photoshop
Corel Painter

Talent

Sherrie Hagan
Ian Kline



Slaving Background Rooms

If you thrive on technical challenges, shooting multiple rooms with flash is your long-awaited playground.

There are numerous elements to juggle, and with each solution, you create a new challenge that needs to be counterbalanced.

General Illumination

Flooding the room with light is the relatively easy part. All you need is a couple monster light banks, sufficient support, and plenty of flash power. 3,000 watt-seconds bathes the living room in soft, even illumination.

Ambient Light

The next challenge is extending the shutter speed sufficiently to pick up the glow of the lamps. This is another important juggling act.



Slaves

What's hidden is part of the fun. We have two flash heads plugged into one 1,000 watt-second pack. They're just blowing light into their spaces. When the soft banks fire, the back power pack's slave eye is triggered. 🌸



Position lighting in your back rooms to add dimension to the space. This should build the viewer's curiosity so that they wonder what is in the spaces that they cannot see. When shooting an architectural portfolio of a property, the viewers enjoy using your photos to connect the rooms, figuring out what's where.

Tech Specs

Photographer

Brian Stoppee

Stylist

Tracey Lee

Illustrator

Janet Stoppee

Camera

Nikon D2x - ISO: 100 • Shutter Speed: 2 seconds
Manual Mode

Lens

AF-S VR Zoom-Nikkor 24-120mm f/3.5-5.6G IF-ED @ 24mm
35mm Focal Length: 36mm @ f/14

Lighting

- 2 - Novatron 1,500 Ws Digital Power Packs
- 1 - Novatron 1,000 Ws Digital Power Pack
- 4 - Novatron Bare Tube Flash Heads
- 1 - Novatron 6.5" Reflector
- 1 - Novatron 16" Pan Reflector
- 2 - Novatron Slave Triggers
- 2 - Chimera Novatron Bare Tube Quick Release Speed Rings
- 1 - Chimera 54" x 72" Super Pro Plus - Silver
- 1 - Westcott 54" x 72" Silver Soft Box

Light MeterLight Meter

Gossen Starlite

Support

- 1 - Gitzo Explorer Tripod
- 1 - Gitzo Off-Center Ball Head
- 1 - Matthews Baby Jr. Triple Riser Stand
- 1 - Matthews Baby Jr. Double Riser Stand
- 1 - Matthews Premie Baby Stand
- 1 - Matthews Mini Premie Baby Stand

Software

Adobe Bridge, Camera Raw, and Photoshop
Corel Painter



Location Safety

We have said it before in this volume and we will say it again and again for the rest of our teaching careers: flash and water don't mix. Whether there's a little flash built into the top of your camera or you're working with big power packs, you're dealing with a great deal of voltage.

An accident can result in fatalities.

You must secure your light sources. All wiring needs to be arranged so that no one can trip over anything. Sandbag all your stands. A top-heavy lighting rig can easily wind up in the water with just a little wind power.

Working Against Nature

This was a great shoot that required plenty of planning. The window of opportunity was a matter of minutes.

We needed just the right ambient light at the end of the day, plus as little breeze as possible. With the added danger of an approaching thunderstorm, our window was closing.

The Rosco Fog Machine

This is where a fog machine makes it fun. We need just a tiny breeze to move the fog across the pool's water. Too much wind has the fog sailing into the neighbor's backyard, in a matter of seconds, long before the fabulously fit Jaime emerges from the water.

When the breeze is just right, an assistant fogs the pool to the right, and the talent slowly starts up the stairs, dripping wet.

Lighting

We wanted a sense of mystery to the image, so we lined the pool to the left with four large light banks.

This total sidelight approach keeps some of Jaime hidden, in partial shadow. More important it brings out the smooth contours of her well-toned physique.

It's planned for her to walk into her mark, so that light captures the blue of her eye and there's enough of a highlight on her lips to reveal a trace of a welcoming smile.

A stock image like this has many uses.

The rest of the light banks ensure that we light the fog in motion.

In Safety Conclusion

Just as we squeezed off the perfect shot, the sky opened up and the rain came in.

In seconds, we had shut down the power packs and disconnected their power cables.

The Novatron power packs self-discharge the energy in their capacitors when they are shut off. Some other brands require you to press the test button to do that. ☼

Tech Specs

Photographer

Brian Stoppee

Stylist

Tracey Lee

Illustrator

Janet Stoppee

Camera

Nikon D2x - ISO: 100 • Shutter Speed: 1/40
Manual Mode

Lens

AF Zoom-Nikkor 80-400mm f/4.5-5.6D ED @ 80mm
35mm Focal Length: 120mm @ f/10

Lighting

2 - Novatron 1,500 Ws Digital Power Packs
2 - Novatron 1,000 Ws Digital Power Packs
4 - Novatron Bare Tube Heads
3 - Chimera Novatron Bare Tube Quick Release Speed Rings
1 - Westcott Novatron Bare Tube Adapter Ring
1 - Chimera 54" x 72" Super Pro Plus - Silver
1 - Chimera 54" x 72" Super Pro Plus - White
1 - Chimera Super Pro Plus Strip - White - Medium
1 - Westcott 54" x 72" Silver Soft Box
1 - Rosco 1700 Fog Machine

Light Meter

Gossen Starlite

Support

1 - Manfrotto Tripod with Quick Release Head
1 - Matthews Baby Jr. Triple Riser Stand
1 - Matthews Baby Jr. Double Riser Stand
1 - Matthews Premie Baby Stand
1 - Matthews Mini Premie Baby Stand

Software

Adobe Bridge, Camera Raw, and Photoshop
Corel Painter

Talent

Jaime Etheridge



Mixed Lighting Effects

A clever stylist comes with a bag of awesome tricks acquired through years of experience. Sometimes the photographer can feel like the second in command.

It's all a matter of being a team player and allowing everyone to bring plenty to the table.

For this shoot, Robert Young is assisting Tracey Lee, our usual tabletop stylist. Together, they have a variety of setups in progress. Robert has taken over this one.

Backlight as Key

Tabletop photographers often make their backlight their key light. At first, that does not sound as if it makes any sense.

What we have been discussing so far is the power of reflected light.

Backlight adds dimension, even to a simple gift-wrapped box. If the backlight is the only light source, isn't the foreground in darkness?

If you are reading this on a sunny day, with your back to the window, aren't you backlit?

It's a natural illumination.

The Reflector

Here's where our reflector plays a key role. It's taking the backlight, harnessing it, and filling in the foreground.

However, when it comes to shooting many great photographs of beer, so much of the

story is in the head of the beer, and that's the primary reason for going with the backlight. It brings out the texture of the beer's head.

Flashlight?

Robert has gotten the idea that we add a second back light: a flashlight. No. That's not a typo. He's not considering a "flash light," Robert wants us to drag the shutter while he waves a hand-held flashlight behind the beer.

Because our flashes are at 5,500 K and the flashlight is in the range of 2,500 K, it warms up the amber color of the beer.

The flash pops. The shutter remains open. Robert and the flashlight go to work. The shutter closes down, completing the shot. It all has to happen fast. It's all about the team effort.

The Stylist's Touch

Some beer photos look flat. We start with a frosty glass. Rather than wasting many glasses of raspberry wheat ale, Robert uses an iced tea spoon to stir the ale, rebuilding the head. The shoot starts and ends in minutes. 🌸



Make your backlight a key light when shooting products. Allow a reflector to fill in the front illumination. This is extremely effective when the subject is

glassware. In addition to stirring the beer to build a head, the stylist shines a flashlight as a second backlight while we drag the shutter.

Tech Specs

Photographer

Brian Stoppee

Stylists

Tracey Lee
Robert Young

Illustrator

Janet Stoppee

Camera

Nikon D2x - ISO: 100 • Shutter Speed: $\frac{1}{50}$
Manual Mode

Lens

AF-S Zoom-Nikkor 28-70mm f/2.8 IF-ED @ 70mm
35mm Focal Length: 105mm @ f/5.6

Lighting

1 - Novatron 1,000 Ws Digital Power Pack
1 - Novatron Bare Tube Head
1 - Chimera Novatron Bare Tube Quick Release Speed Ring
1 - Chimera 24" x 32" Super Pro Shallow Plus Bank - Small
1 - Westcott 14" Silver/White Illuminator

Light Meter

Gossen Starlite

Support

1 - Gitzo Explorer Tripod
1 - Gitzo Off-Center Ball Head
1 - Matthews Premie Baby Stand

Software

Adobe Bridge, Camera Raw, and Photoshop
Corel Painter



Bouncing the Big Space

In Chapter 12, “Wireless Battery Flash,” we spoke a great deal about the use of bounce light. The photographer who covers events must master bouncing light.

Bounced illumination can save the day for the photographer who has to light a big space.

Umbrellas for Key and Fill

It’s a thrill to shoot anywhere at the Lewis Ginter Botanical Gardens, in Richmond, Virginia. Every space is beautifully designed and appointed. The library is no exception. The arched ceiling is breath-taking.

We photographed Bob with a silver umbrella as a key light to the viewer’s left and a gold and white zebra umbrella to the right. It has a nice dimensional feeling. However, with no other illumination, the model would appear as if he were in a darkened cave.

Ceiling Bounce

Making use of the arched ceiling offers all of the general

illumination that we could have hoped for. Because of its shape, any light that strikes it is going to scatter all over the place.

To take advantage of this, we placed a monolight on a tall stand and cranked it up into the arched area. Without a reflector on it, the light is dispersed over more than 180°. The head is behind Bob on the viewer’s left.

Because the light is so inefficient without a reflector, it supplements the light that the umbrellas provide, rather than overcoming it in competition for exposure. We have additionally measured the ambient illumination to utilize the natural window light. 🌞



Tech Specs

Photographer/Illustrator

Janet Stoppee

Stylist

Sherrie Hagan

Camera

Nikon D2x - ISO: 100 • Shutter Speed: 1/125
Manual Mode

Lens

AF Zoom-Nikkor 80-400mm f/4.5-5.6D ED @ 180mm
35mm Focal Length: 270mm @ f/5.6

Lighting

1 - Novatron 1,500 Ws Digital Power Pack
2 - Novatron Bare Tube Heads w/6.5" Reflectors
1 - Novatron M600 MonoLight
1 - Westcott 45" Silver/Black Backing Umbrella
1 - Westcott 45" Gold/White Umbrella

Light Meter

Gossen Starlite

Support

1 - Gitzo Explorer Tripod
1 - Gitzo Off-Center Ball Head
1 - Matthews Baby Jr. Triple Riser Stand
2 - Matthews 40" C Stands w/Sliding Leg

Software

Adobe Bridge, Camera Raw, and Photoshop
Corel Painter

Talent

Bob Lindholm



Create Window Effects with Cookies

You can wait around all day for just the right dappled light to come through the window, or you can just create it yourself, twenty-four hours a day, by using a cookie!

Cucoloris

A “cucoloris” goes by many names. The most common is “cookie.”

A cookie is similar to a gobo, in the sense that it gets into the path of the light. However, the gobo is more commonly applied to light modifiers that are right there, at the lighting instrument, whereas the cucoloris is a much larger pattern that gets in the way of the light’s path, much further along on its journey to a surface.

Hard or Soft Cookies?

Commercially created hard cookies are usually made of a plywood material. Some folks spend a great deal of time cutting their own hard cookies from cardboard and discarding them when the project has been completed.

Soft cookies are sometimes produced from screening. One of these is more accurately known as a “cello cucoloris.”

The “hard” and “soft” terms refer to the edge that they produce. Because the cookie produces a natural shadow effect, it’s a matter of how much of an edge you want.

The Matthews Cucoloris

Both soft and hard cookies are included in Matthews Lighting Control Kits. They’re in either 18" x 24" or 24" x 36". Photographers find the smaller size to be more than sufficient for many projects.

The wood cucoloris is kept to a manageable weight with a luan plywood and a very durable metal grip that firmly attaches to the various Matthews clamps. The grip head permits easy tilting and rotation.

A cello cucoloris from Matthews is a screen material wrapped around an open-ended metal frame with a pattern on it, created from a clear plastic.

Chimera’s Window Pattern Kit

This kit offers popular ways for news crews to project an interesting pattern on the background of a space where an interview happens.

For photographers, it keeps them popular in neighborhoods where location shoots happen: assistants are not compelled to go out and tear off a few tree branches to make a background

shadow on the wall. There’s no need to carry mini blinds to project light through, either. This system of plastic film patterns attaches onto a black frame with hook-and-loop tape.



The frame attaches to Chimera's 42" x 42" panel frame.

The black frame provides 12" all the way around the pattern. This is a perfect fit to be

illuminated by the Chimera 24" x 32" Super Pro Shallow Plus Bank. The 42" x 42" panel frame prevents any light from spilling in unwanted places. Chimera has two pattern sets that include blinds, a leaf, palms, French doors, columns, a half dome, a domino, sun scratch, an open win-

dow, and split door, plus a clear pattern for logos or other things that you need to project.

As always with Chimera, the kit thankfully comes in its own rugged duffle bag. 🌀



To the left are Matthews hard and soft cookie products. On the right is Chimera's interchangeable film-based solution.





Essential Tablet Tools



Is it possible to be a photographer without a camera? How about without a computer? Can you retouch images in Adobe Photoshop without a pressure-sensitive tablet? If you can, you'll have to tell us how. As far as we know, a Wacom tablet is an essential tool for today's photographer.

This indispensable means of manipulating images at your computer takes its name from "wa," Japanese for "harmony," and "com" meaning computer. In its quintessence, Wacom can be said to provide humankind with a means of being at harmony with the machine.

Truer words were never spoken.

Today, Wacom can even be in harmony with your wallet. Little professional Wacom tablets are available for around a couple hundred bucks (in US dollars). There's no excuse for not having one. If you're serious enough about photography to buy and read this 504-page book, you're clearly a Wacom person.

We could never accomplish what we do in Adobe Illustrator, Adobe Photoshop, and Corel Painter without our Wacom tablets. Our original 12" x 18" tablet had the serial number of 99 on it. We've been in this for a long time.

It's a kinesiological interactive experience that cannot fully be described. Creating on a tablet feels like you are touching the image, becoming one with it. As you apply pressure to the stylus to achieve your visual goal, there's a coordinated relationship between the mind, eye, and body mechanic. Your entire being becomes involved in the creative process. 🌸

The Tablet that Fits Your Needs

If you are new to Wacom's tablets, let's bring you up to speed on what this is all about so you can make an informed decision.

Wacom tablets come in two flavors for professional use: Intuos and Cintiq.

Wacom also has some special products that are industry-specific. Additionally, there

are a few popular consumer products from Wacom. But Intuos and Cintiq are for you.

Intuos

For every point that your pen can touch, there's a matching point on your screen. Whatever you do with your pen, you see an

equal and precise reaction on your computer's display.

The tablet and pen provide 1,024 levels of pressure sensitivity. The touch and feel are all at your custom control using the software tools that Wacom provides. The pen tip reacts based on how hard you press it upon the tab-



let. If your subject's blemish needs just a tiny helping hand from Photoshop's healing brush tool, tap lightly. If it's more like a seriously nasty zit, dig in deep.

The Intuos is all USB-powered, so it's very much an on-the-go input device, with active area sizes of 4" x 6", 6" x 8", and even 6" x 11", these tablets are around the size of a Mac laptop. Their physical dimensions range from 10.6" x 8.5" to 16.5" x 10.3".

The width of the 4" x 6" tablet is about 20% larger than the photo of the Intuos on the opposite page.

Our 6" x 11" easily fits in our Lightware Laptop Messenger bag, along with all the other Mac gear that we take on location and other business travel.

The bigger Intuos tablets, at 9" x 12", 12" x 12", and 12" x 19", with a physical dimension of 24.5" x 16.9", are a bit more studio-bound. Our big guy feels right with big displays.

Cintiq

After working on a Wacom tablet for a while, it feels like you are almost touching the screen, rather than the tablet, with your pen. If you have a Cintiq, strike the "almost" from that statement. The Cintiq is a combination tablet and LCD display. You touch the screen with your pen. It's a faster, more natural experience.

The Cintiq family of interactive pen displays continues Wacom's tradition of delivering world-class productivity tools that make

using a computer as natural as possible. By using a pen directly on a screen, you work more quickly and naturally. It recalls the feeling of working in traditional media, where the pen makes contact with the actual surface and as you apply pressure, you see immediate results, on a textured, scratch-resistant surface.

For the studio-bound there's 21UX, with a 17" wide active area. The 21 is in the 4:3 aspect ratio.

Though it weighs in at 22.4 pounds with its stand, the Cintiq 12WX has similar dimensions to our 6" x 11" Intuos and weigh only 4.4 pounds. It's the dream of the traveling media professional. 🌸

The actual size of the Wacom Intuos pictured at left is about 20% smaller than their 4" x 6" tablet. On the previous two-page section is the Cintiq.

Tablet Tools

The Intuos comes with a grip pen and a five-button mouse.

For some it may feel a little funny at first, as you get your eye, mind, and hand coordination in gear, but it soon becomes second nature. Others of us dive into it from minute number one.

Tablet as Desktop

The tablet and tools transform your desktop. We have roll-out keyboard trays and sometimes work with the 6"x11" Intuos in our laps.

The tablet in essence becomes your desktop. Our hands are near the keyboard for those quick key commands that we can surely do in our sleep. But outside of

them, we navigate our way around the computer screen with the tablet.

On the Cintiq, keyboard commands are out of mind. The tendency is to reach out and touch everything. Because the grip pen tip is right there, you are compelled to use the pull-down menus.

The Grip Pen

Just like a pencil, the grip pen has both a tip and an eraser. With time, the soft grip pen becomes an extension of your hand. You twirl the thing around 180° using the nib for this application here, and erasing that thing there.

To keep your Cintiq desktop clean, it has a solid stand to keep it upright or parallel to the working surface.

Pen as Mouse

As soon as the pen is within two-tenths of an inch of the tablet, it's active.

The pen nib is like a mouse-click. Tapping it twice is like a double-click.

The DuoSwitch

This is another cool tool. The switch on your pen is a rocker. As long as you are hovering the pen two-tenths of an inch above the surface, the DuoSwitch is active. By default the top of the switch is like a double-click and the lower portion is like a right-click in the Windows world.

The switch is fully programmable. Read more on this in this chapter.

Five-Button Mouse

With Wacom's professional tablets, the mouse is exclusive to the Intuos. Many in the creative community use the Cintiq somewhat upright, so a mouse would not have the proper ergonomic feel.

The five-button programmable mouse has no rolling ball. There are no optics. It doesn't need a battery. There isn't even a wire.



This is not your typical mouse.

Alternate between the pen and the mouse to balance the right tool for the right job. This also cuts down on repetitive motion.

The left and right buttons do the obvious. On the side are another set of left and right buttons. In an Internet application, they are the same as back and forward.

The Finger Wheel

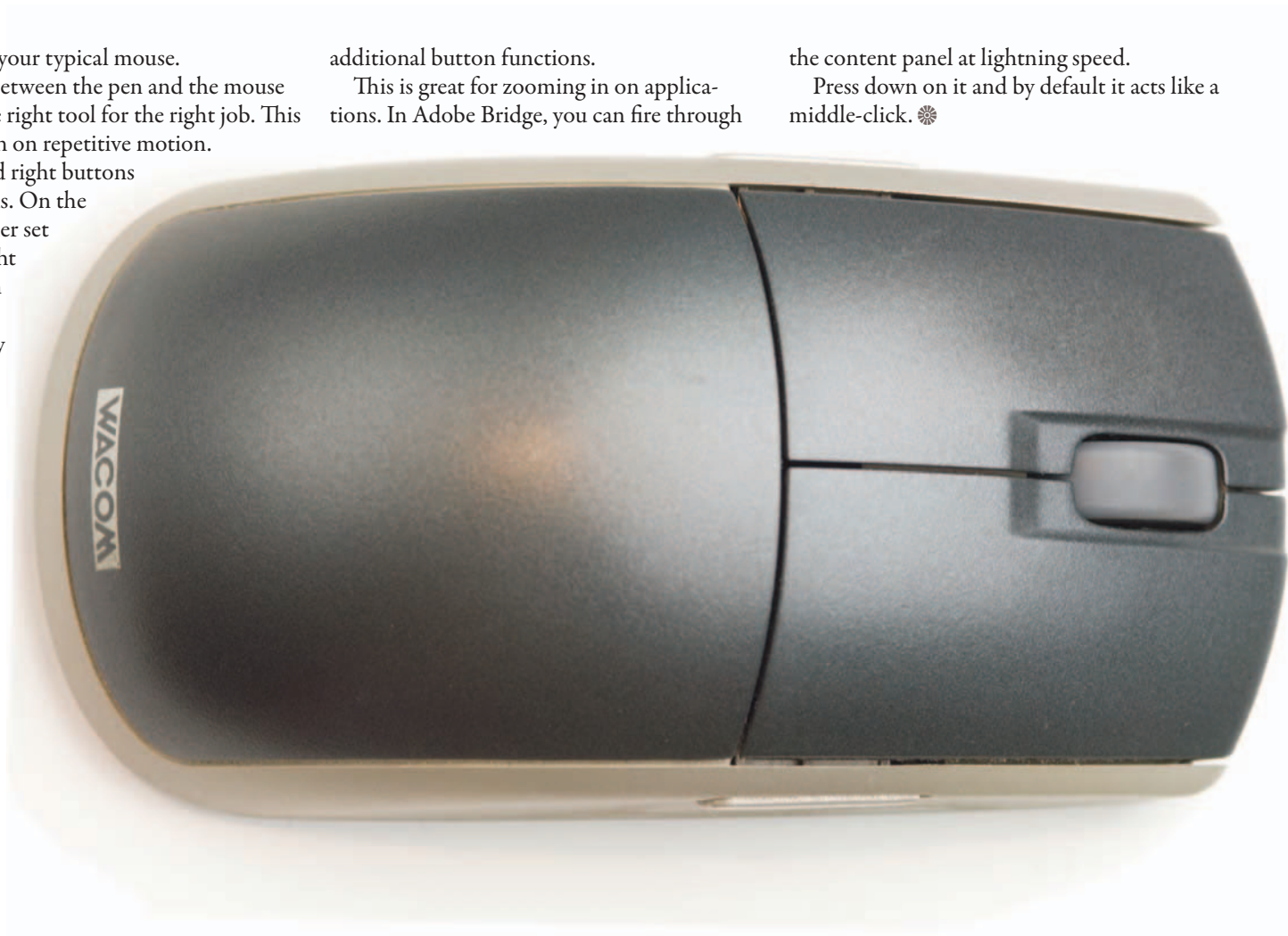
This isn't the standard scroll wheel. You can both roll it and press it down for

additional button functions.

This is great for zooming in on applications. In Adobe Bridge, you can fire through

the content panel at lightning speed.

Press down on it and by default it acts like a middle-click. 🌀



ExpressKeys and Touch Strips

Assuring us that the company very much brings a new harmony to the machine, Wacom has built a few extremely special tools into their professional tablets that are unlike anything else in the computer environment.

Keeping the pen in your dominant hand, you are able to use the other to touch these programmable strips and keys.

ExpressKeys

On the upper portion of the tablet are four buttons on the outer edges. These are your ExpressKeys.

By default, the four ExpressKeys (four on the right and the same four on the left) are the same as the Command, Shift, Alt, and Space keys on your keyboard. This feature permits you to take control of many Adobe and Corel functionalities without needing to resort to the keyboard.

These keys are fully programmable. We'll get into that on pages 436 & 437.

On the smaller Cintiq 12WX, there is a fifth ExpressKey pair. This is for multiple monitor setups.

Touch Strips

On the Intuos, the touch strips are next to the ExpressKeys on the inside.





The touch strips work three different ways. By default, you can run your finger up the strip and you'll zoom in; down, and you zoom out. It's also a means of scrolling.

For continuous operation, pressing and holding your finger at either end of the strip scrolls up and down a document.

The touch strips work three different ways. By default, you can run your finger up the strip and you'll zoom in; down, and you zoom out. It's also a means of scrolling.

You can also tap the top or bottom of the strip to go through zoom or scrolling one step at a time.

Pen Instead of Finger

If working with your fingers on the Intuos touch strips does not sound appealing, use your pen instead. 🌀

Make It Feel Right

If you are new to Wacom, take some time and get comfortable with their fabulous new tools. Don't rush things.

There's a learning curve. For some, it's an instantaneous relationship. Others take a little while to get into a comfort zone.

Give yourself a little time.

If you've had a Wacom tablet for a while, but have not explored how to customize it, you are in for a special treat. You'll wonder why you have not gotten around to all these fabulous options before now.

The Wacom Control Panel and Tool Tips

If you have had a Wacom for a while, go to wacom.com's support section and make sure that you have the latest driver and install it.

Now, let's make sure that you have optimized its setup.

On a Mac, go to the System Preferences in your Dock, and click on Wacom Tablet.

Windows users, go to the familiar Start, find Programs, select Wacom

Tablet, and then choose the Wacom Tablet Properties option.

Are all the controls that just appeared on your screen a bit daunting? Do you feel that this is just too much to take in?

If you're concerned about what each one of those controls do, just mouse over any one of them and a little "tool tip" will pop up.

For example, see the "Details" button? Mouse over it and after a couple seconds a little box will appear and tell you, "Click here to set advanced Tip Feel settings."

Now, explore the whole control panel and get comfortable with what each control's tool tip tells you.

Tip Feel

How you apply pressure is a big deal in

making your Wacom tablet your own. Some of us are bit more heavy-handed than others. We have different expectations as to how the pen ought to achieve results for us.

Let's do a fun exercise to see how you can optimize your tablet.

Under Tool, click Grip Pen.

Tap the pen anywhere and watch the Current Pressure respond.

Click on the Details button.

Two sliders appear. One is for Sensitivity and the other is for Click Threshold.

Just lightly scribble in the Try Here area.

Now, slide Sensitivity all the way over to

Firm.
Scribble
with the same
light pressure. Probably
nothing is appearing in the
Try Here area at all. Scribble
again, trying with plenty of
pressure. Many people would



end up with hand fatigue if they had to press this hard all the time.

Try your light touch, slide it all the way back at Soft. Is your slightest move being detected?

The Stroke Nib

Before we go further, let's change

the nib in your

pen. For

most of the work

you do in Photoshop

and Painter, you might prefer

a different nib than the one that

comes standard with the pen. Wacom

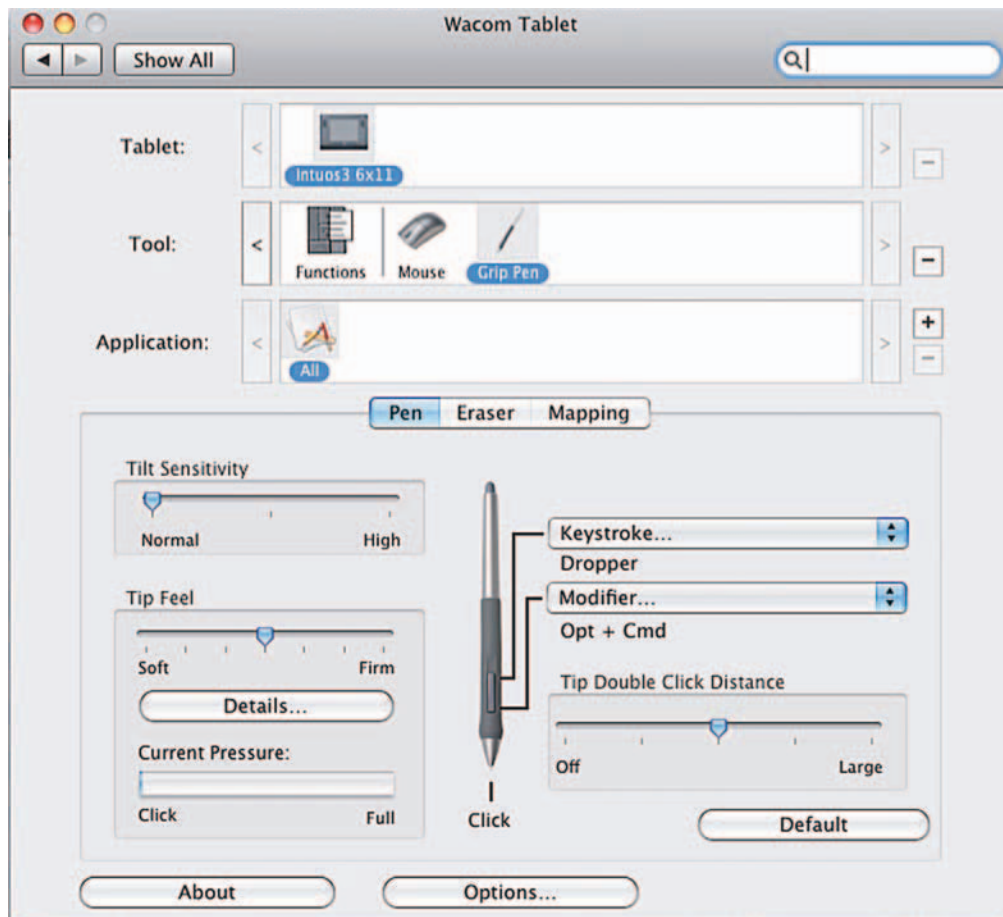
provides extra nibs with the pen. Find the one

with the little spring. Use tweezers or some

similar tool, like the little circular one that

Wacom is now supplying and pull out the

original nib. Replace it with the springy one.



Now, experiment with the Try Here area some more. Do you sense the difference?

Next, flip the pen 180° and set the eraser.

Click Threshold

Your grip pen has to become your mouse at times, allowing you to click on this or that. The click threshold determines the amount of pressure it takes to get that needed click reaction.

Experiment with this in the Try Here area until you get it just right.

Test Drive

Now that you've gotten a feel for really owning your Wacom tablet, let's get out of the showroom and get this out on the road.

Launch Photoshop and open a new window. Zoom in to 100%.

Get the Brush tool. Just draw a couple of straight lines.

Go back to the Wacom control panel and change the sensitivity to something super soft.

Return to Photoshop and draw a few lines. Try applying different pressures. Do the lines look similar, no matter how much pressure

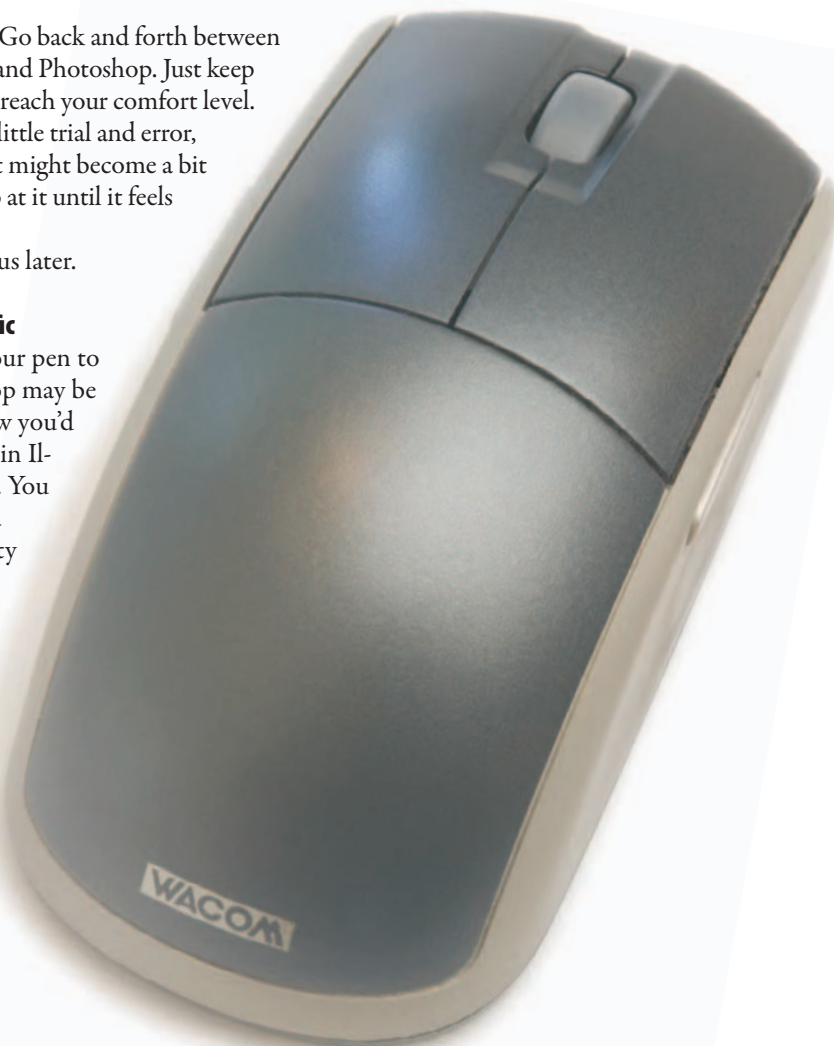
you are applying? Go back and forth between the control panel and Photoshop. Just keep trying it until you reach your comfort level. This might take a little trial and error, and after a while it might become a bit tiresome, but keep at it until it feels right for you.

You can thank us later.

Application-Specific

How you want your pen to react in Photoshop may be different than how you'd like it to respond in Illustrator or Flash. You can give the pen a specific personality for each software application, too.

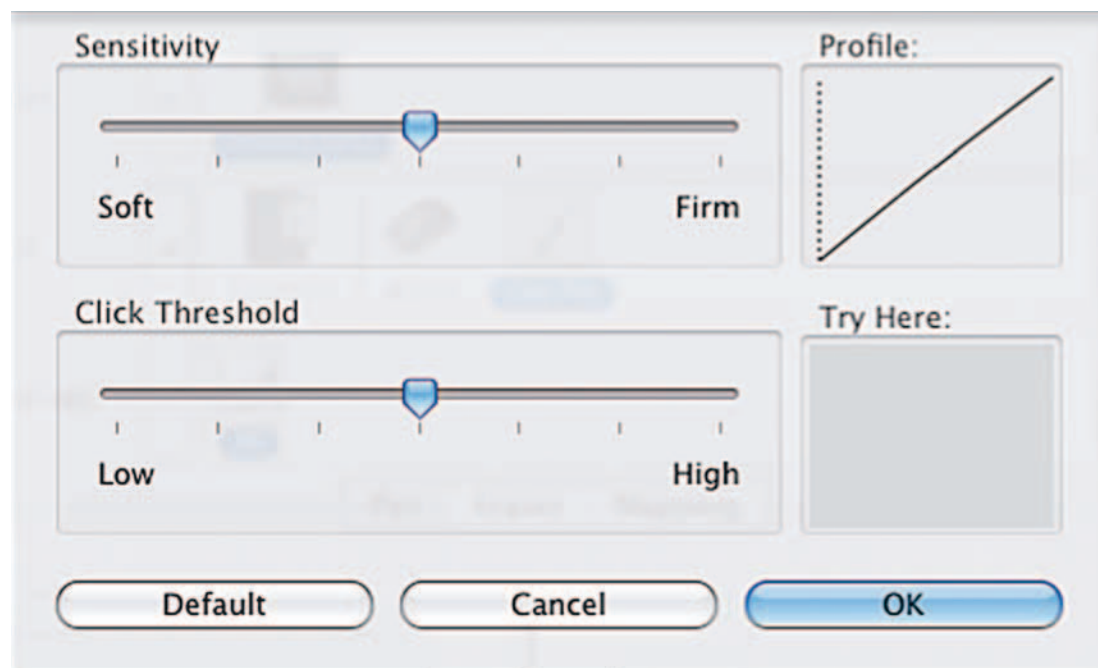
Try this out in Photoshop, by launching it and then going to the now familiar



Wacom control panel. In the panel's application field, there are little plus and minus buttons to the right. Click the plus and you'll see a series of your applications appear. Choose Photoshop. Now go back to the tip feel and make adjustments with the Detail button. Bounce back and forth between

Photoshop and the Wacom panel until you get it just right.

To see the results, in Wacom's applications panel, click on All Others and then click back to Photoshop. You'll see the sliders change. 🌀



Keep working on the “Try Here” area of the dialog box until you have customized the feel of the pen, to suit your preference.

Do the same for each software application that you work in.

Then customize for the Wacom mouse and its buttons.

Program the ExpressKeys

You want to work as intelligently as possible with your Wacom tablet. There are all sorts of key commands that you probably use already. There are surely pull-down menus that you go to frequently. Skip them and put the ExpressKeys to your own use, by programming them for your needs.

Fit in Window with an ExpressKey

By way of example, with Adobe's Camera Raw, Illustrator, InDesign, and Photoshop plus Corel's Painter, we need to get out to Fit in Window or zoom to 100% all the time. This shortcut is Alt + Command + the zero key.

We could use the touch strip to get there, but we prefer one click to the precise view.

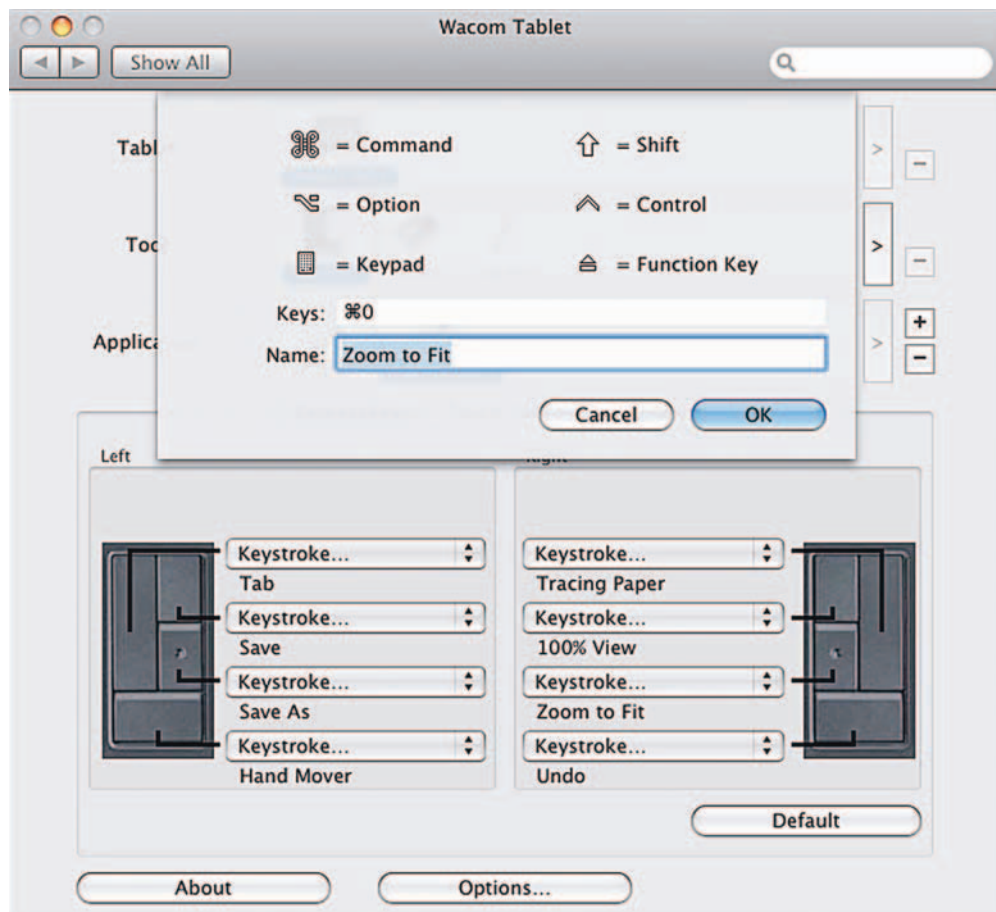
On the Wacom control panel, click the Functions graphic.

All the Intuos tablets have eight function buttons except the 4" x 6" which has four. The Cintiq 21UX has eight as well, but the 12WX has ten buttons.

Select one of the buttons, and from the menu choose Keystroke. In the new dialog box that appears, hold down the Alt and Command key and tap the zero key. It appears on the dialog box. Click OK.

When you are prompted to give this a name, type "Zoom to Fit."

To the right is how we set up Painter. ☼



Adjust a Cintiq

Everyone has a preferred angle of view when working with the Cintiq. Think of your mother saying, “Do we have good posture?”

The Cintiq is somewhat mesmerizing. It’s easy to want to climb into the image and become part of the scene. You don’t want to find yourself slouching over the display and feeling sore the next day.

Working Incline

The Cintiq’s stand has a unique spring-loaded action. The front two feet have a firm rubber grip on a surface. It holds well. The back feet are rubber rollers.

There are two big flippers on the back of the stand assembly. Pulling them against the back of the Cintiq releases the clutch mecha-

nism, and the roller feet are free to move about the surface of your desktop.

When lowered, the Cintiq not only has an incline similar to a traditional drafting table, but also allows you to rotate the tablet. If you like to work on projects at a slight angle, just like a piece of paper, this is a plus for working with the lower incline.

To adjust the Cintiq, it’s best to stand with the tablet facing you, holding your thumbs against the front and your fingers on one of the flippers. The left lever lowers and the right lever raises.

The Cintiq has a little bit of play to it, so let it settle down before you let go. Assume that it will settle back a bit, when adjusting it to your favored angle.

Lighting in the Work Environment

This is a good time to consider your work environment’s illumination.

The Cintiq can pick up glare. Not only is it difficult to clearly judge the image quality of the project that you are working on if there’s glare on your screen, but it’s hard on your eyes, to the point that it can give you a headache.

Wacom’s Cintiq has excellent color fidelity and brightness. Choose a task-oriented light that focuses illumination away from anything that produces glare. Just as you want a good color balance to the light you shoot with, aim for the same in your own work environment. If you need to judge the color and texture of reflective materials as you work, you want a great light source. 🌸





Jeanette Stoppie

Light of Painter

Whether you are a photographer with just a little bit of an illustrator in you or you have a whole bunch of artist waiting to come out, Corel's Painter has something for you.

Many photographers are gaining commercial success by adding Painter to their image manipulation toolbox. Many Adobe Photoshop professionals work with both software applications. Painter has some similar workspaces to Photoshop, so it's easy to get comfortable, but it brings a boatload of extra features with it that are nothing like Photoshop's capabilities.

Some of what Painter does is very much unlike Photoshop's market, so don't plan on seeing these features being offered by Adobe anytime soon.

Any portrait studio that has not gotten onto the Painter bandwagon needs to do so. If you have not attempted to sell your photos rendered as if they are paintings, you are missing out on some handsome profits.

We were one of the first adopters of Painter 1.0 and built quite a reputation for ourselves with the photos we could turn into illustrations on our then brand-new, now long-gone Mac Quadras with monitors that required two strong people to move.

Some Painter features are automated. If you have the ability to retouch images in Photoshop, you probably have the needed expertise to find what Painter can do for you with the same level of exploration that you've put into your other software applications.

The image to the left was primarily achieved with Painter's Auto Painting feature. 🌻

Understand Traditional Media

Painter has a wealth of natural media tools and surfaces for you to apply to your photographic work. Not only does it have the appearance of traditional media, but Painter offers a user experience that does the best job of replicate working in media that has been the means of visual expression for as long as fine art has existed. The only things missing are the smell and the cleanup.

Painter + Wacom

Working in Painter demands a Wacom tablet. It's part of what makes Painter a very tactile, interactive experience.

As you apply pressure to the pen while working with chalk, you see the results of the power your muscles exert on the tablet as if you are holding chalk in your hand and applying it to charcoal paper.

Sampler and Cloning

On the following two-page section, we have a sampling of six surfaces with six sets of popular Painter media that we work with on photographs. The best way for you to work in Painter is through the use of cloning.

Cloning is perfect for the photographer. With the photo as the clone source, the clone tools (virtually all of them) derive their color information directly from what you shot. 🌻

Tech Specs

Photographer/Illustrator

Janet Stoppee

Camera

Nikon D2x • ISO: 100 • Shutter Speed: 1/250
Aperture Priority

Lens

AF Zoom-Nikkor 80-400mm f/4.5-5.6D ED @ 400mm
35mm Focal Length: 600mm @ f/5.6

Lighting

1 - Nikon SB-800 Speedlight

Support

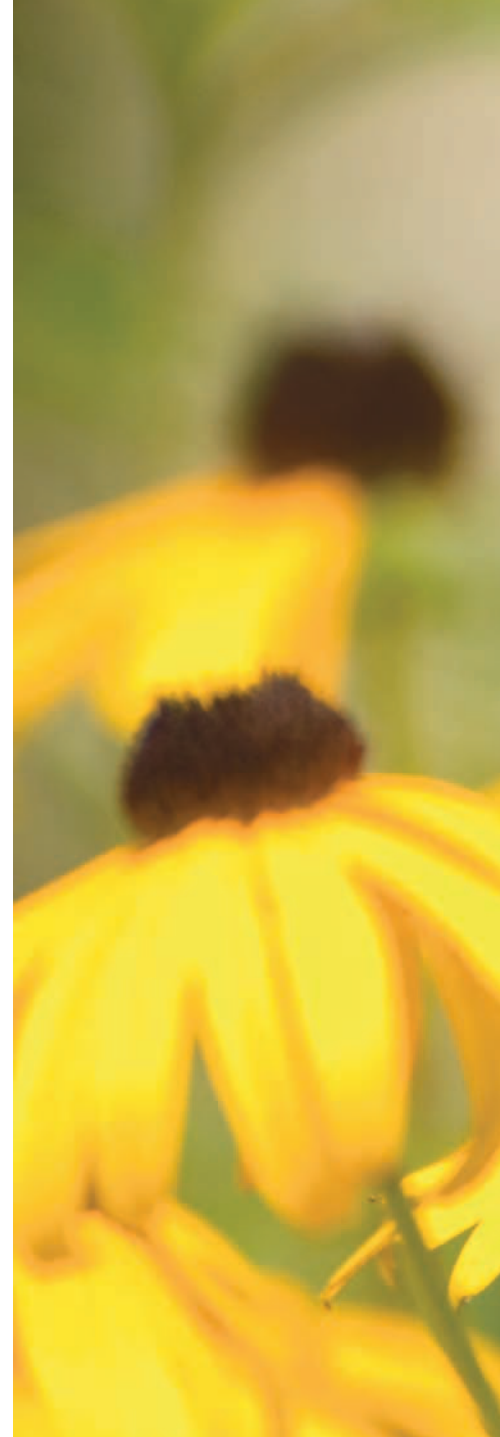
1 - Gitzo Explorer Aluminum Tripod
1 - Gitzo Off-Center Ball Head

Software

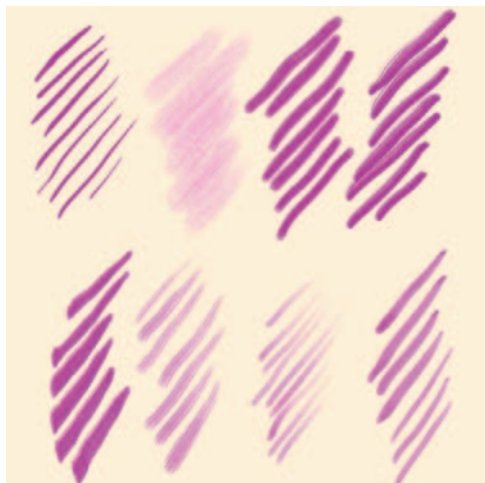
Adobe Bridge, Camera Raw, and Photoshop
Corel Painter

Photographing black-eyed susans on a hot August day, Janet chose a long Nikkor zoom. Using a Nikon D2x camera made her 400mm focal length the equivalent of a 600mm. The image has the feeling of a long expanse of the droopy pedaled flowers. The yellow seems to convey the heat of the day.

To pop them out, she's using a Nikon fill flash on camera. Though it seems like quite a stretch for flash, it isn't. Plus, there's a visual illusion created by the optical compression. The photographer and the flower are not as separated as they may seem.







Acrylic on Gessoed Canvas

- ✦ Opaque Detail Brush
- ✦ Glazing Acrylic
- ✦ Opaque Acrylic
- ✦ Thick Acrylic Bristle
- ✦ Thick Acrylic Flat
- ✦ Wet Acrylic
- ✦ Wet Detail Brush
- ✦ Thick Acrylic Round



Airbrush on Charcoal Paper

- ✦ Detail Airbrush
- ✦ Fine Spray
- ✦ Fine Tip Soft Air 20
- ✦ Graffiti
- ✦ Pepper Spray
- ✦ Tapered Detail Air
- ✦ Variable Spatter
- ✦ Soft Airbrush 30



Chalk-Pastel on Charcoal Paper

- ✦ Square Chalk
- ✦ Tapered Artist Chalk
- ✦ Variable Width Chalk
- ✦ Pastel Pencil
- ✦ Round Hard Pastel
- ✦ Soft Pastel
- ✦ Soft Pastel Pencil 3
- ✦ Square Hard Pastel



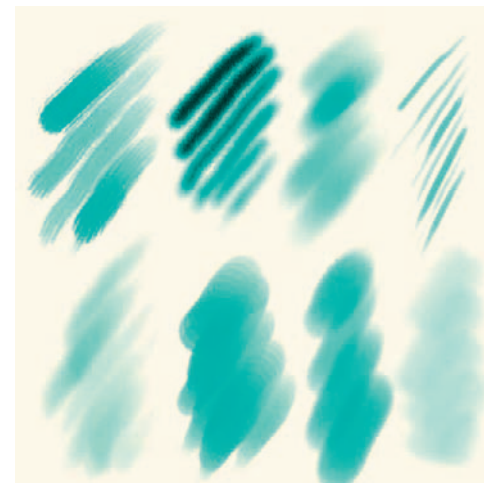
Oil Pastel-Charcoal on Sandy Pastel Paper

- ✎ Chunky Oil Pastel 10
- ✎ Round Oil Pastel
- ✎ Soft Oil Pastel
- ✎ Variable Oil Pastel
- ✎ Charcoal
- ✎ Charcoal Pencil
- ✎ Sift Charcoal
- ✎ Soft Vine Charcoal



Pencil on Basic Paper

- ✎ 2B Pencil
- ✎ Covered Pencil
- ✎ Grainy Variable
- ✎ Greasy Pencil
- ✎ Mechanical Pencil
- ✎ Oily Variable Pencil
- ✎ Sharp Pencil
- ✎ Sketchy Pencil



Digital Watercolor on Italian Watercolor Paper

- ✎ Coarse Dry Brush
- ✎ Diffuse Water
- ✎ Coarse Mop Brush
- ✎ Fine Tip Water
- ✎ Flat Water Blender
- ✎ Simple Water
- ✎ Wash Brush
- ✎ Soft Broad Brush

The Painter Workspace

The Painter interface is different from other software applications that you may be used to.

It's a very carefully thought-through and intuitively designed user experience that has to depart from the norm. It's not different for the sake of being unique. Painter has a level of functionality needed to perform its very powerful tasks with ease, which requires the interface that they've chosen.

As soon as you get comfortable with Painter, the interface will become second nature. You should find it refreshing and quickly reach your comfort level.

This is not a Painter how-to book, so we are not going to walk you through all of what Painter can do for you or explore all the tools.

There are some excellent resources that already exist. Painter has a following of accomplished creative professionals in animation, design, filmmaking, illustration, and photography. Many of them have inspirational samples at corel.com, and there are quite a few excellent books.

Jeremy Sutton shares many of our philosophies on good Painter work practices. He has some excellent books and DVDs on both Painter and the Wacom tablets.

1. Toolbox

Many of Painter's tools need no introduction. By the time photographers arrive at Painter, they should have some background in at least Adobe Camera Raw, and Photoshop and maybe other Adobe Creative Suite applications. Though we urge you to study the very thorough user guide, in an age when printed manuals are difficult to come by, you can pretty much grab a tool and get started.

2. Color Selection Box

Here's a feature that fools an Adobe user into thinking this is where you switch from the foreground to the background color. In Painter, the working surface is the background. This makes the front square your main color and the back square the additional color. Though you work only with a main color for the most part, some brushes have more than one color. Just like working with traditional media, your brush carries more than one paint color from your palette at a time.

3. Selectors

Working smart and working intuitively is part of the Painter experience. Selectors are how you gain fast access to what you need without

cluttering your desktop. The selectors get you into libraries of:

- Papers
- Gradients
- Patterns
- Weaves
- Looks
- Nozzles

4. Colors Palette

A legendary hallmark of Painter is how colors are chosen. The colorful doughnut that encases a triangle is something of a trademark. Many do

not know that a small color palette is available, trading the ring for the vertical bar of color that various other color pickers offer.

To keep the desktop clean and customized to each users' needs, Painter allows you to collapse its long palette features into single bars.

Below the colors is a mixer where you electronically blend colors, much like a painter would with a traditional palette that's filled with oils, acrylics, watercolors, and so on.



After that are the color sets for fast access to repetitive needs and familiar libraries of color. You can save sets of color.

The color info palette (not pictured here) has a misleading name. It's more than information. This palette allows you to use RGB or HSV sliders or enter color value numbers into the fields.

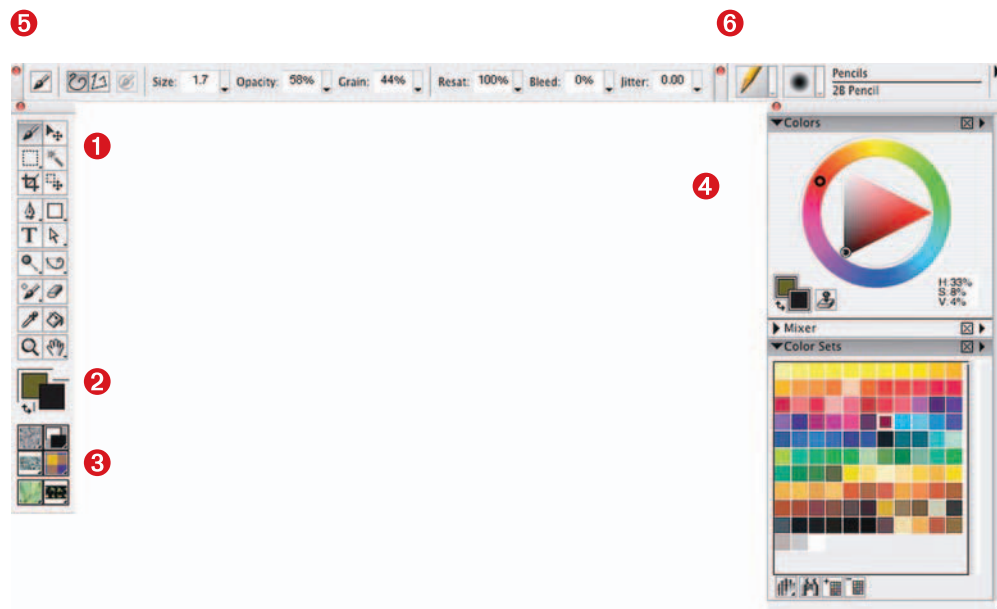
5. Property Bar

Much like what you are used to in Adobe applications, with each Painter tool that you select, the property bar takes on that tool's characteristics. It saves your settings or if you become completely lost, the bar can be reset to its defaults.

6. Brush Selector Bar

We've saved the best for last. This bar has many personalities and is one of Painter's most powerful assets. You must get acquainted with this one right away. It's one of Painter's great strengths.

Brushes have two personality traits. First, they fall into a category such as those that we sampled on the previous two pages. On the brush selector bar, you see a vast array of thumbnails for all available brushes.



Next, you select a brush variant. This bar also shows you thumbnails representing the characteristics of the stroke.

As you would accurately guess, Painter provides you with plenty of customizing options that go beyond the variant menu.

Brush Creator

The Brush Creator allows you to design custom brushes using the randomizer for manipulating

variants, a transposer that permits the blending of more than one existing brush's personality, plus a stroke designer. Change their size, shape, angle, and flow to suit your needs.

Painter power users love this.

Without running all the bases, we hope we have given you enough of a peek into Painter's power to motivate you to explore it and make you feel comfortable with how we created the images in the rest of this chapter. 🌸

Chalk and Pastel

Shooting dockside near the Chesapeake Bay in the middle of September does not take a great deal of effort to find available talent. Young Christian Terry and his teenage sister Alexis were right at home.

Even with quite a volume of models and a last-minute change of location, the shoot went smoothly, due to the very casual atmosphere that everyone was enjoying.

We try to keep our equipment load to a minimum for these sort of things. Working with the natural elements and modifying the light is the best way to work as fast as possible, switching out lenses and changing positioning as frequently as possible to produce a shoot filled with variety.

As fast as our assistant producer/talent director can get people changed, she's back on the set directing when possible.

For this image, our only light source was the Matthews reflector panel that we can be placed on a stand, on the dock, and positioned perfectly to harness the sun's rays.

Once again, Janet is shooting with an AF Zoom-Nikkor 80-400mm *f*/4.5-5.6D ED, making it nearly impossible for her to direct the talent herself from such a long distance without sounding as if she's shouting at everyone. However, the rewards are in the compression that the lens provides and the feeling

that we are quite close to the subjects. Being as dear as they are, getting to know them is the natural reaction for the viewer.



The image as captured (above) is taller than it appears to the right, as is the illustration, though to us, both work well.

Choosing Painter Media

How do you take a photographic image and turn it into an illustration?

The first step is to become intimately acquainted with Painter's available media.

With time, you can just look at a photo and know that it works well as a "chalk and pastel" or you can think, "I want to do something in chalk and pastel. What's in my library?" Because we shoot and retouch thousands of images a year, we have a vast library to pull from for illustration.

Chalk and Pastel

There's a certain simplicity to chalk and pastel. It's abstract, in the sense that it gets to the purity of the image with the most basic attributes of visual expression.

There's a joy to this medium. It's perfect for children. The colors can be vibrant and bring great life and joy to an image, just like the children themselves.

Texture is key to the personality of chalk. In Painter, the creative identity of chalk is quite similar to what the actual sticks display, a strong response to the surface to which they are applied.

Unlike some natural paint media, where there is all sorts of mixing involved, chalk is pretty much an "is what it is" kind of me-

Tech Specs

Photographer/Illustrator

Janet Stoppee

Stylist/Talent Director

Sherrie Hagan

Camera

Nikon D2x - ISO: 100 • Shutter Speed: 1/250
Manual Mode

Lens

AF Zoom-Nikkor 80-400mm f/4.5-5.6D ED @ 340mm
35mm Focal Length: 510mm @ f/6.3

Lighting

Matthews Aluminum Hand Reflector 24"x24" with Black Yoke

Light Meter

Gossen Starlite

Support

1 - Gitzo Explorer Aluminum Tripod
1 - Gitzo Off-Center Ball Head
1 - Matthews Mini Preemie Baby Stand

Software

Adobe Bridge, Camera Raw, and Photoshop
Corel Painter

Talent

Alexis Terry
Christian Terry



dium, so with Painter, it acts the same way. As you apply new color, the chalk interacts with what has already been applied to the surface.

Pastel is a slightly different animal. It can completely cover what has already been laid down on the surface, as do soft pastels. The harder you apply pressure with the pen tool, the greater the opacity gained.

Harder pastels expose more of the surfaces with which they have contact.

Christian's Illustration

As you can see from the progress illustration to the immediate right, Janet started with some basic pencil outlines to plan and guide her work. However, as she worked, it appeared too stiff. It didn't have the fluidity and joy that expressed the moment. She saw new compositional energy and recognized how with the medium, she could create a different kind of colorful celebration that cannot happen behind the lens.

In essence, one image happens photographically, and can stand confidently on its own. The illustration is a separate form of communication that owns its own personality. The two are self-sufficient.

Once Janet got deeper into the big chalk, she mucked in the canvas in a very short period of time with the big bold colors to the



Plan your illustration of a photo with the same thoroughness that you bring to a photo shoot. Painter lets you sketch in the basics right from the tracing paper that is overlaid upon the photo on your screen. As you work, it becomes your guide, which you can work over the top of or place on a separate layer, just



as you do in Illustrator, InDesign, or Photoshop, with similar familiar controls.

Once your basic outline is there, vigorously enjoy mucking in all the colors that become your illustration's foundation, as Janet did with the above. After that's complete, carefully bring in the details.

immediate left. This then became her new jumping-off point to giving the image a fresh and playful life of its own.

The spontaneity of mucking in the color becomes such a rapid response that it revs her engines to create. Though this happens in the studio, it has a similarity to the energy that develops on a shoot day, when so much is happening and it's all happening fast.

Once the foundation has been poured, Painter now allows you a little time to become more introspective in the finishing of the details that make the image more touchable. This is the point when you can almost feel the quality of the little guy's blonde hair and the warmth of their sweaters on a day when the fall's bay breezes are starting to come ashore.

The warmth of the colors express the love of an older sister for her little brother.

If you are in the wedding or portrait studio business, this is the kind of warmth and love that you want your images to express.

This is where Painter offers your customers a very special prized image that augments the rest of the photographs that they choose from after a photo session with you.

They make perfect big prints, as we get into in the final chapter of this volume, that's coming up next. 🌸



Acrylic

It was a great honor to photograph Sonya, her husband, John, and their first newborn, Owen. Sonya's one of our favorite models and this was Owen's first photo session.

In a very confined space, we used only one umbrella with a Novatron bare tube head, which amply filled the room with a soft gentle illumination, perfect for the warm, loving environment of their home.

This is a very spontaneous moment. It would seem as if 1,500 watt-seconds overdoes the needs of the space, but it allows us to crank the power output way down so that our recycling time is rapid. As fast as Janet sees images happening and as Brian is directing the couple, she is able to knock off photo after photo as fast as she recognizes that a great shot is in front of her eyes.

Translating to Illustration

The firmness of the acrylic medium speaks of a firm family foundation in the present.

It's reminiscent of the work of the old masters' oils with a fresh twist and a progressive interpretation and style.

In Painter acrylics resemble how the natural media reacts to the underlying media as it is applied on top of one and other. It builds with the existing pixels in the same place on your canvas as you work.

Tech Specs

Photographer/Illustrator

Janet Stoppee

Stylist

Tracey Lee

Camera

Nikon D2x - ISO: 100 • Shutter Speed: 1/250
Manual Mode

Lens

AF-S VR Zoom-Nikkor 70-200mm f/2.8G IF-ED @ 102mm
35mm Focal Length: 153mm @ f/7.1

Lighting

1 - Novatron 1,500 Ws Digital Power Pack
1 - Novatron Bare Tube Head w/6.5" Reflector
1 - Westcott 45" Optical White Satin Umbrella with Removable Black Cover

Light Meter

Gossen Starlite

Support

1 - Gitzo Explorer Aluminum Tripod
1 - Gitzo Off-Center Ball Head
1 - Matthews Premie Baby Stand

Software

Adobe Bridge, Camera Raw, and Photoshop
Corel Painter

Talent

Sonya Peretti-Hull
John Hull
Owen Hull





The Hull's Family Portrait

Janet took a very aggressive approach to this illustration in the first few moments of its execution, quickly laying in the base colors that take the form of how the acrylics will react. Her dive-in-and-do-it approach overcomes that “fear of white paper.” This should feel quite familiar to photographers who need to shoot for the moment.

Next, Janet got into the details quickly, working in the refined facets of the infant first and bringing in those of the adults later.

The final image retains the spontaneity of the initial colors that Janet laid down. She’s developed a relationship with Painter, going back to the very first weeks of the introduction of the software that came in a one-gallon paint can. She knows how the media reacts, going back to her first oil in the mid-1990s.

If Painter seems a little unfamiliar right now, don’t sweat it.

Dive in.

We bought one of the first issued Adobe Photoshop 2.0 releases. We explored Adobe InDesign when it was still version 0.x (beta).

If you’re a long standing professional photographer, was figuring out your first camera a little odd? If you’ve been pro for decades, did your first digital SLR seem strange?

It all becomes familiar sooner or later. 🌸



Start with laying in some of the foundational color. Painter picks up on this as the layers of paint are placed over each other.



Next, bring in your details, refining the specifics that will be cherished by your subjects for the rest of their lives.





Oil Pastel

It was admittedly one of those great personal spontaneous moments when we were in the midst of working with a primarily new crop of excellent talent at a marina. All of a sudden, our assistant producer's daughter (who came to hang out with mom and her big brother) became filled with life, hanging off railings and doing all sorts of cute things. We just had to drop what we were doing and grab some fun shots of her.

The only response was to set the camera to programmed automation and just let it do its thing and hope for the best. When a four-year-old gets in gear, you don't want to miss a second of opportunity.

Though we had a ton of gear with us, it was all allocated elsewhere. These are times when you don't want to be caught without a great camera.

Oil Pastel

To mimic the style of a natural dry medium, Painter's oil pastels had to closely resemble those deep, thick rich tones and hues of working with actual oil sticks.

The brush variants primarily build over whatever color has already been laid down.

The exception is the Variable Oil Pastel, which naturally picks up on whatever color lies below it.

Tech Specs

Photographer

Brian Stoppee

Stylist

Sherrie Hagan

Illustrator

Janet Stoppee

Camera

Nikon D2x - ISO: 100 • Shutter Speed: 1/160
Programmed Auto

Lens

AF-S VR Zoom-Nikkor 70-200mm f/2.8G IF-ED @ 125mm
35mm Focal Length: 187mm @ f/6.3

Support

1 - Gitzo Mountaineer Tripod
1 - Gitzo Off-Center Ball Head

Software

Adobe Bridge, Camera Raw, and Photoshop
Corel Painter

Talent

Christie Mayo

Christie's Moment Is Janet's Moment

Janet departed from the secure norms for this illustration. Rather than relying on the tracing paper, she did not want to stifle her creativity. This encouraged her to go for the darker paper and explore a more free-flowing





direction, much as little Christie was feeling on the shoot day.

Working with a custom palette, Janet began to freely lay in the background with a favorite medium of hers, Square Chalk 35. Here's where one of the benefits of oil pastels is a plus: it doesn't pick up on the chalk below. It allows Janet to get a sense for where she's taking the illustration, without being concerned for any repercussions from what helps to set up the image.

Next, the pastel details fill in and all the joys on a child's face are realized. At this point, Janet still has to perfect many of the intricacies in the star on Christie's favorite shirt, as well as all the other refinements that make a portrait so recognizable to the subject's friends and family. Finding those specific elements are right there in that photo you first acquired. Now that you have come this far with the image, you need to just confidently illustrate the details.

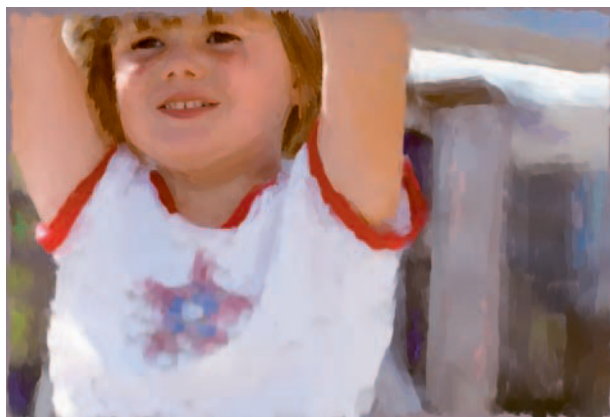
Painter, like all of the professional software applications that we use, intimidates some. It's so powerful. It's so unique. Make the workspace your own. Get as comfortable with it as you used to be with that old film camera of yours that you'd take everywhere.

Have fun.

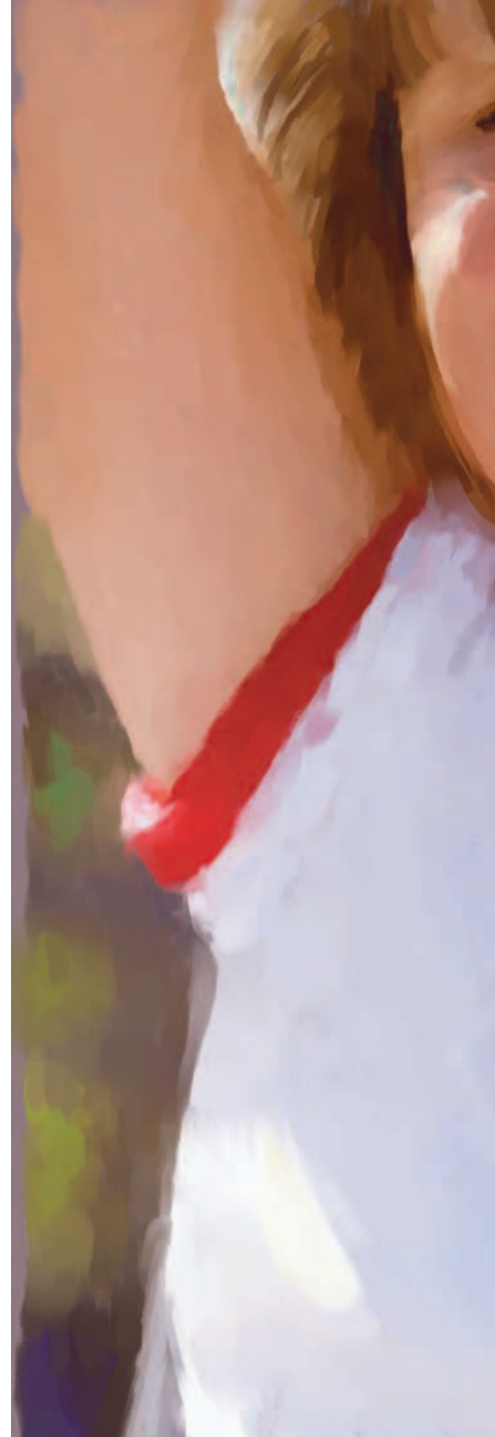
Let your fun show. 🌸



After setting a dark paper color, Janet begins laying in some of the background to develop a guide for herself.



When choosing a colored paper, Janet cannot use the tracing paper feature, though she is still cloning and sees the photo on screen.





Janet Stoppel

Watercolor

Flora and watercolor have been married for surely for as long as the painting medium has existed. For any avid macro photographer the spring arrival of the peony is a good excuse to capture them when they are at their peak.

Because of its size, the peony tends to be disrupted by even the most gentle breeze. Also keeping them on the move are the bees, who love to get into the peony's yellow stamens and kick around all that they can, further pollinating the species.

It's a macro shooter's goal to prevent all of nature's motion from causing a blurry photograph. Your best line of defense is flash illumination. For gardens that are far afield, we use the Nikon wireless battery flash that we explored in depth in Chapter 12, "Wireless Battery Flash".

Adjacent to plenty of electrical power, we hauled out a 600 watt-second monolight: a Novatron M600 MonoLight. We overcame all the breezes and insects that nature could toss our way.

It's an incredibly fast way to shoot botanical images. For the most part, as long as your light-source-to-subject distance remains the same, you can take your meter reading and move from subject to subject. Though it's a little extra to haul around, be sure to weight your light stand. A sudden breeze can toss the

lighting equipment toward the back of your head while you are concentrating on what the viewfinder is tempting you with.

Layered Watercolor

Painter offers two ways to work in watercolor. One is a layered effect that's fun to watch. You can wet a canvas and activate a diffusion process. As you apply watercolor to the artwork, you can see that effect take place, much like traditional natural media. A falling water droplet icon indicates that the drying process is happening. This is quite a popular medium for working from a photo.

There is a time delay for the process to take place. When you work fast, this can require some patience.

We work fast.

We are short on patience.

We prefer the digital watercolor method.

Digital Watercolor

As you can see in the image to the right, digital watercolor is characterized by a softness and edges that feather out. You adjust your level of diffusion from the property bar.

Using the selection tool, you can confine where the watercolor can spread. It will diffuse only in the area to which it is restricted, much like the watered area on dry paper.



Above, Janet starts much as many watercolorists do, by lightly applying pencil lines to the paper. Unlike the lines that can plague the end result of traditional painters, Janet can keep her lines on a separate layer that she can delete later. She can then toggle the tracing paper on and off, allowing her to fully concentrate on the image in front of her, while enjoying the guidance of the pencil lines, as needed.

Tech Specs

Photographer/Illustrator

Janet Stoppee

Camera

Nikon D2x - ISO: 100 • Shutter Speed: $\frac{1}{60}$
Manual Mode

Lens

AF Micro-Nikkor 105mm f/2.8D
35mm Focal Length: 157mm @ f/11.0

Lighting

1 - Novatron M600 MonoLight

Light Meter

Gossen Starlite

Support

1 - Gitzo Explorer Tripod
1 - Gitzo Off-Center Ball Head
1 - Matthews Premie Baby Stand

Software

Adobe Bridge, Camera Raw, and Photoshop
Corel Painter



Wet Fringe

Painter offers you a little more control over your water and paint than the traditional watercolorists enjoy. The wet fringe of a stroke can be adjusted before you dry the application.

You can increase or decrease the pooling of water. A brush stroke remains wet until you choose to dry it.

Dry Time

Once you have made strokes and are satisfied with the results, go to the Layers menu and choose Dry Digital Watercolor.

Much like traditional watercolor, you have to work cleanly if you want crisp colors. This medium does not respond well to color buildup. It becomes muddy.

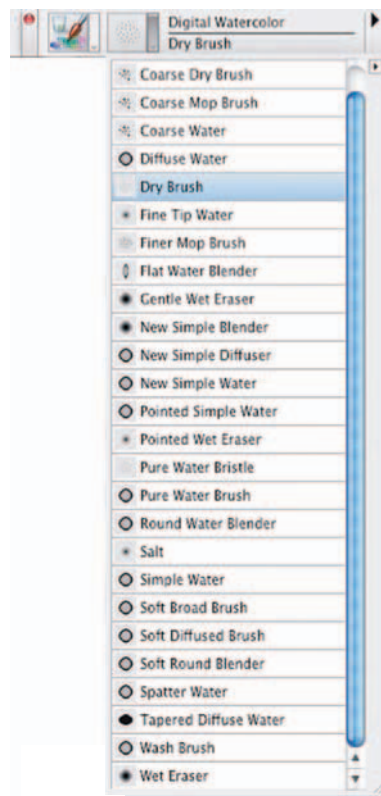
Pencil Lines, Tracing Paper, and Planning

Because paint buildup is your enemy in watercolors, you have to plan where the image is going. You can do this with pencil lines, much as you would in traditional media. One of the many pluses of Painter is that you can put the pencil lines on a separate layer and delete the layer later. This helps you to map out what you're going to do and serves as an exercise in getting better acquainted with the photo.

Others skip the pencil lines and dive in using the tracing paper as their guide. It toggles

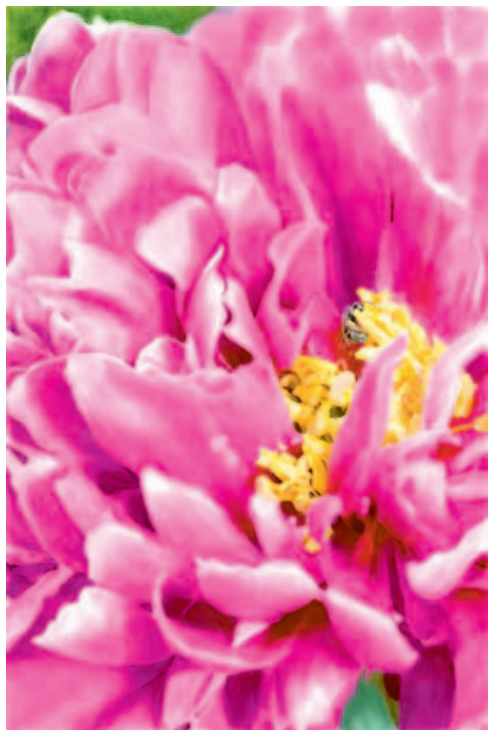
on and off with command + the “t” key, so you see the end result.

This could be a key command that you wish to program into your Wacom tablet. 🌸



To the right is a partial list of the brush variants that Painter supplies for Digital Watercolor Dry Brush. Janet varies these as she works on an illustration just as some traditional watercolorists would.

Above, you can see that at this point in the process, Janet has brought in a fair amount of the color, providing a base that can dry before she comes back to make additional color application, as is happening above.



The final watercolor illustration now has all of the refined details, as Janet works with the tighter brushes. Though the finished illustration closely resembles the original photo, it has a personality of its own.



Photo Auto-Painting

The photo pretty much speaks volumes for how this segment of the day's shooting went. One of us would shoot while the other attempted to direct, but as long as the kids were having a good time with their parents, we were just the background noise.

Some days, staged shoots are more like a series of "found" photos.

Divine Proportion

Painter has a cool tool to assist you in evaluating the composition of a photo. Divine Proportion, related to the Rule of Thirds and the Golden Spiral, has been a classic means of determining a sense of proportion for artists, designers, and architects, going back millennia.

Follow how the overlaid green line on the image in the upper right of this page is similar to how your eye explores the composition. It's a good way to test the image's visual strengths before starting.



The divine proportion feature (above) provides a helpful overlay to determine the strength of your image's composition.



Tech Specs

Photographer

Janet Stoppee

Stylist

Tracey Lee

Illustrator

Janet Stoppee

Camera

Nikon D2x - ISO: 100 • Shutter Speed: 1/250
Manual Mode

Lens

AF Zoom-Nikkor 80-400mm f/4.5-5.6D ED @ 180mm
35mm Focal Length: 280mm @ f/5.3

Lighting

1 - Novatron M600 MonoLight
1 - Chimera Panel Frame - Large w/Diffusion Material

Light Meter

Gossen Starlite

Support

1 - Gitzo Explorer Tripod
1 - Off-Center Ball Head
1 - Matthews Premie Baby Stand
2 - Matthews Hollywood - 2-1/2" Grip Heads
2 - Novatron Heavy Duty Stands

Software

Adobe Bridge, Camera Raw, and Photoshop
Corel Painter

Talent

Michael Handy
Collin Handy





We lit this image with one Novatron monolight blowing through a Chimera panel frame for a broad, soft illumination of the area. The talent has plenty of room to move in the set, as we do to recompose.

Smart Blur with Increased Saturation + Contrast

Before Auto Painting begins, Janet goes to the Underpainting palette, sets the smart blur to reduce image noise and achieve a less photo-like effect. It sets her saturation and contrast to warm skin tones. Even before that, Janet creates a clone. She doesn't work on the

original photograph. It remains preserved.

Auto Painting

If you're just getting started in Painter, this is your point of departure.

Auto Painting allows you to make decisions as to how you want its engine to generate Smart Stokes. You get it started and just watch, in awe, as brush strokes begin to

happen on your computer's display.

The medium-sized image on the previous two pages is what Painter generated for us. You can set the stroke type, randomness, pressure, rotation, brush size, and speed.

Once that automated "show" has concluded, you have the opportunity to go into the image and work on specific details that give it a sense of its own personality, as well as the creative direction that is your visual style.

In the image above, Janet has already used the auto painting engine as a place to get started, and has begun to apply the acrylic

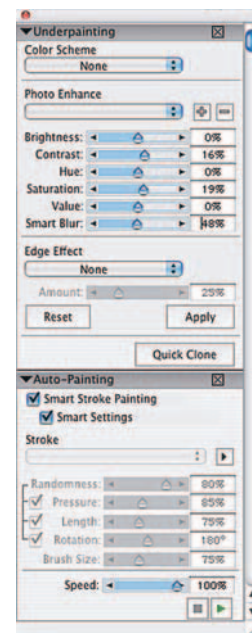
brush to pull out additional detail in the hair, eyes, and skin.

Her favorite acrylic brushes for this image are the Opaque Detail Brush, set with a low opacity; Wet Soft Acrylic, also at a lower opacity; Wet Detail Brush 5; Wet Acrylic 30; and Opaque Acrylic.

To the immediate right are the settings that we used. Feel free to use them as a starting point for your own exploration into Auto Painting.

What makes Auto Painting really work is starting with a great photo. It needs to be well lit, well exposed, and, of course, have terrific compositional qualities.

Folks contact us who have precious images of their own. Some are taken with cell phones. That work has to be turned away if we can't do something great. 🌸







Light and Exhibits

Concluding this volume with printing is quite appropriate, as we started this book by exploring the intricacies of light. Along the way, we have covered a full spectrum of discussions on photography and light. At this point, it's time to harvest the fruits of our labors in ink jet print media.

We've sold our enlargers and processors. All the chemicals left the premises in the late 1980s. We've been completely green for decades.

However, we're still children of the darkroom. Now our darkroom may be digital, but we are still enamored of the gorgeous papers we use to display our work. It's like the stinky old days of glacial acetic acid, only a zillion times cleaner and better.

There's still the thrill of seeing a big high-gloss image roll out of the printer, reminiscent of the anticipation when you opened up those funny Cibachrome tubes that rolled around on a motorized base while some chemicals sloshed about in there with the glass-like paper.

The great part is that we have not lost the museum-quality archival element along the way. Those once short-lived prints that captured some of the most important days in people's lives and eventually faded away don't have to haunt us any more. We can deliver something that lasts for more than a hundred years and actually looks and feels like an elegant exhibit print.

The print process is filled with all the technical and creative trappings of everything else in our digital environment. The call to action is to master it to the best of our abilities, bringing our images to breath-taking life. 🌸

Printer Drivers and Media

We confess to having a bunch of Epson printers. We have them in all shapes and sizes. If we doubled the number of these print output devices at our disposal, we still would not feel completely fulfilled.

We go back to the Epson Stylus Color 3000. In the year 1998, this gave a studio a new empowerment to print and proof jobs under their own roof. We'll never forget taking proofs to a huge offset press site with four brand-new Heidelberg six-color presses (a few million dollars of iron) and seeing the disbelief on the faces of the prepress people, who were astounded that we did the proofing ourselves.

Sadly, that print shop (our favorite) was sold off in pieces years ago. However, the studio empowerment has grown exponentially. We don't know of a for-real studio that doesn't have a for-real ink jet printer.

Throat Size

This funny-sounding term goes back to the days of light-sensitive papers and chemicals.

If your photo studio had really made it, you processed your own film and papers with equipment from Colenta, Hope, or Kreonite. It's what the astute custom photo labs used.

If you primarily printed 5" x 7", 8" x 10", and 11" x 14", a print processor, with a 14" throat, did the job. However, if you needed to

do 16" x 20" prints you had to have a processor with a 22" throat, that let you do 20" x 24", with an extra inch on either side, so the paper didn't jam up in the thing.

Some of this hasn't changed.

Today, there are printers on sale at the office supply stores for well under a hundred bucks that have an 8.5" throat.

The professional throat sizes are (with the maximum 35mm 2:3 aspect ratio and maximum standard available sheet paper size):

Throat	2:3 Aspect	Max Sheet
13"	13"x19.5"	13"x19"
17"	17"x25.5"	17"x22"
24"	24"x36"	24"x30"
44"	44"x66"	24"x30"
64"	64"x96"	24"x30"

The larger print sizes are accomplished with roll paper that typically comes in lengths of 20 to 100 feet.

Ink and Media

Printer manufacturers are not in the business of selling printers. They make their money supplying expendables. It costs more money to repair a sick consumer printer than it does to buy a new one.

Whoever thought up the concept that the computer age would save paper consumption

was a way-off-base daydreamer. History has proven that theory all wrong.

The Drivers

When Apple or Microsoft make a radical change to their operating system, the manufacturers have to return to the engineering drawing board and create new drivers for printers and scanners and various other computer peripheral devices.

There's more to it than getting the computer to talk to the printer, though. The computer needs to have the ability to address the printer specifically for the characteristic of the paper that is being sent through it.

The Media

What ink does to canvas is different than how it reacts to a backlit display material.

Each medium has its own characteristics and how the printer will handle it makes a big difference. If you have ever chosen a plain paper setting by accident and sent a glossy paper stock through the printer, you know what we're talking about.

Getting the Right Driver

The printer manufacturers hope that you never stray from their inks and papers. However, as the market grows, the demand for

great papers increase. Moreover, there's a glut of lousy papers out there at you-get-what-you-pay-for pricing.

Some of these good, bad, and ugly papers will work just fine with the drivers you download from the printer's web site. *(Please see page 178 & 179 for more on this.)* However, for great results, get the proper profiles.

By way of example, the Lyson Cave Paint Photochrome V3 pigment ink jet inks are color-matched to the original Epson Ultrachrome K3 Inks and designed for our Epson Stylus Pro 4800, so that they can be successfully used with the standard Epson-supplied profiles and driver settings. They are that close in color.

However, Lyson has a complete set of profiles for some of the smaller high-quality Epson printers as well as older Epson wide-format printers that do not use the Epson Ultrachrome K3 ink.

Besides Epson, you can also find profiles for hundreds of high-end printers at lyson.com. These are for printers such as Agfa, Canon, Grand Sherpa, Kodak, Mimaki, Mutoh, and Roland.

The right profiles make all the difference. 🌸



ICC Profiles

A “printer profile” is a description of the way your output device reproduces color on specific papers. The profile is a combination color and curve adjuster.

Three Profiles

We’ll use Adobe Photoshop as an example. It needs three different profiles:

Input: This profile describes the color characteristics of the device where the image came from. Primarily the image source is a scanner or digital camera.

Display: High end-monitors come with their own profile information. Windows users

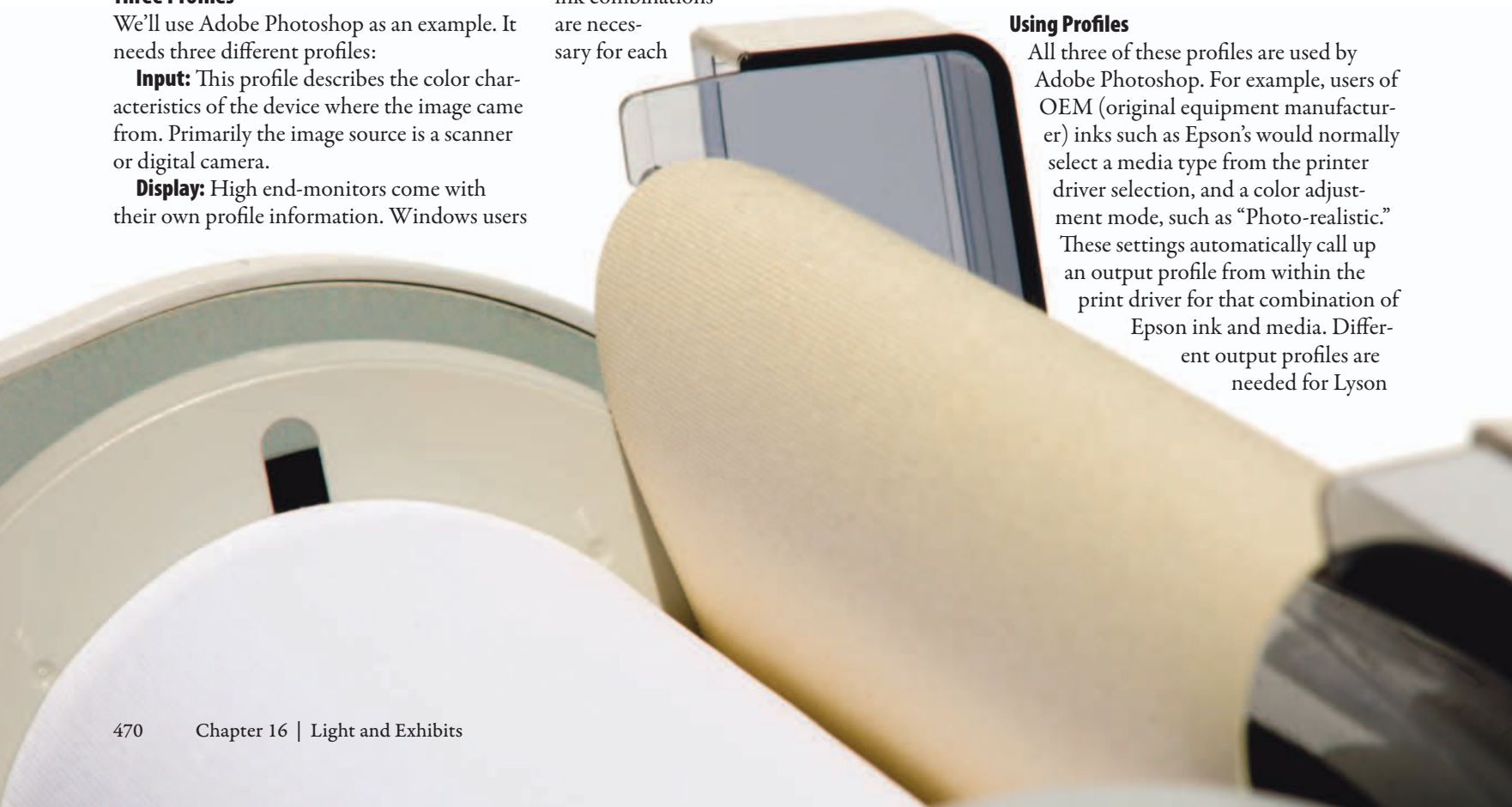
can create ICC profiles of their monitor with Adobe Gamma. Mac users have the advantage of the ColorSync utility for creating monitor profiles, as we discussed on pages 172-177.

Output: The profiles for printer, media, and ink combinations are necessary for each

print medium that you use. All print media is different. Each medium usually requires its own profile. For our fine prints we use Lyson inks and the ink2image papers that Lyson’s North American arm sells.

Using Profiles

All three of these profiles are used by Adobe Photoshop. For example, users of OEM (original equipment manufacturer) inks such as Epson’s would normally select a media type from the printer driver selection, and a color adjustment mode, such as “Photo-realistic.” These settings automatically call up an output profile from within the print driver for that combination of Epson ink and media. Different output profiles are needed for Lyson



products, because their inks have a different color balance than Epson inks. These differences are necessary so that the Lyson inks can provide the performance benefits, such as true fade resistance and improved vibrance.

Once the color of the ink has changed, the old printer driver can no longer manage the color reproduction correctly without help. This is where Lyson profiles come in, correcting the reproduction and in many cases enhancing it.

Where Are My Profiles?

Both Mac and Windows store profiles in various folders in the operating system:

Mac OS X: Follow this folder route to your ColorSync profile: Users > [user name] > Library > ColorSync > Profiles.

Windows XP: We're told they're in C:\windows\system32\spool\drivers\color.

How Many Colors Can I Print?

Color reproduction is a tough one to nail down. There are many variables involved with how large of a color gamut can be produced.

The same printer and same ink set will produce a different color gamut, depending on which media is being run. On one printer, you will have one result and on a different printer with the same ink set and media, a different result. How each brand of printer deals with media and ink varies.

Gloss and satin coatings often produce the largest color gamuts. Matte coatings have the smallest gamuts.

Vibrant dye-based ink sets have more punch to them compared to a pigment-based ink, but dye-based inks come with their own set of challenges, especially in print longevity. However, the color gamut for the pigment-based ink may be wider. Most color gamut models don't consider the vibrancy or visual quality of ink and media combinations.

Print Speed versus Density

A larger color gamut is achieved through the higher-color-density Epson print head. Some other printer manufacturers claim to have faster print times.

This is true.

However, faster speed can mean less density. Less density translates into a smaller color gamut.

Get all the color you can.

Print with a head that offers the greatest color density.

Four Inks... Six Inks... Eight Inks

Over the years, the CMYK family has had babies. It's grown to C, LC, M, LM, Y, and K, adding light cyan (LC) and light magenta (LM). Then C, LC, M, LM, Y, K, LK, and LLK, tacking on light black (LK) and light, light black (LLK). Now it's become C, LC, VM, LVM, Y, K, LK, and LLK, trading out magenta and light magenta for vivid magenta (VM) and light vivid magenta (LVM).

What's this all about?

Color gamut!

The printer manufacturers are always attempting to expand the smaller color gamut of CMYK while bringing out a greater richness in the blacks. By printing with more inks, the output improves. 🌸

To the left, a roll of ink2image canvas media is being loaded onto an Epson wide-format, 8 ink printer.

Control Ink; Interpret Your Vision

On pages 178 & 179 we discussed color printing control in relationship to matching what you see on the monitor and what comes out of the printer. Here we'll revisit some of this and put it into practice.

Converting Engines

Your computer's display works in red, green, and blue (RGB), while your printer has four to eight or more inks based in cyan, magenta, yellow, and black (CMYK). Something needs

to convert one color space into another.

Those calculations are handled by an "engine." There are a range of engines available for the Macintosh. Adobe ACE is our preference. On the Windows side, the engine is the Color Management Module (CMM).

Rendering Intent

When you select File > Print, you are confronted with a series of choices. Again, we discussed this back on pages 178 & 179, but let's explore what's going on when you make those selections. You're telling the engine how to convert one color value to another.

What's happening is that the engine is "mapping" color values from your computer, the RGB "source space," to the printer, the CMYK "destination space."

Relative Colormetric

This intent provides the truest, most accurate conversion possible. Individual color values are mapped directly to their equivalent. However, in the conversion from RGB to CMYK, not all colors are available. Colors that lie outside the reproducible range of the destination source space are clipped. There are blocked-in colors in areas of high color intensity that cannot be reproduced with any detail.



Relative Colormetric is especially preferred when using a six- or an eight-color printer with a large color gamut. This choice is great for satin and gloss papers.

Perceptual

What's sometimes known as "photographic intent" provides a pumped-up, high-contrast print conversion. Some consumers like this more vivid look. However, tonal values can shift to accommodate the wider range of tones. The details in areas of high-intensity color are preserved. This conversion is popular when converting from a wide color gamut (RGB) to a smaller color gamut (CMYK) or vice versa. It is often recommended for photographic printing.

What Else?

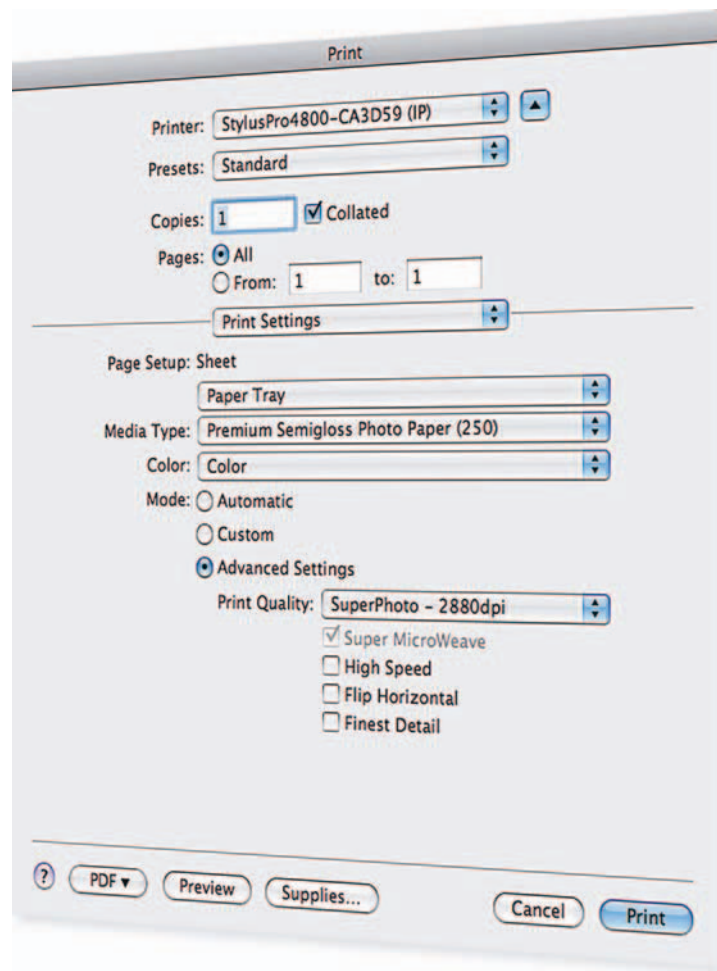
As we discussed on pages 178 & 179, other rendering intents such as Absolute Colormetric and saturation, have no role in professional photographic printing.

Embedding Profiles

When you save an image, Photoshop asks if you want to tag the file with the RGB working space that you used to create it.

These tags can affect your work. When you embed the working space with your photo, you record how your images appear on your display as well as the raw data in the file. It provides the opportunity to send images for printing elsewhere while allowing the other party to open your file and have Photoshop convert it into their color space.

This conversion changes the appearance of the file to match how it looks on your display. The other party can see it as the image appears to you. The conversion process actually changes the data to get it to look right on their display, unless the other party saves the image after viewing it or changing it so that it now matches their display. 🌸



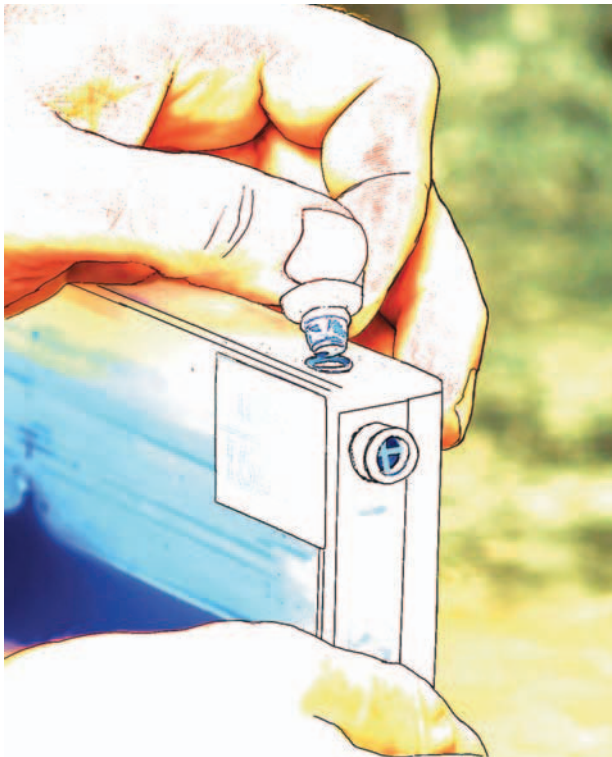
Manage Ink

It's annoying and expensive: always buying new ink jet cartridges drives us nuts. A complete set for wide-format printers is a few hundred dollars.

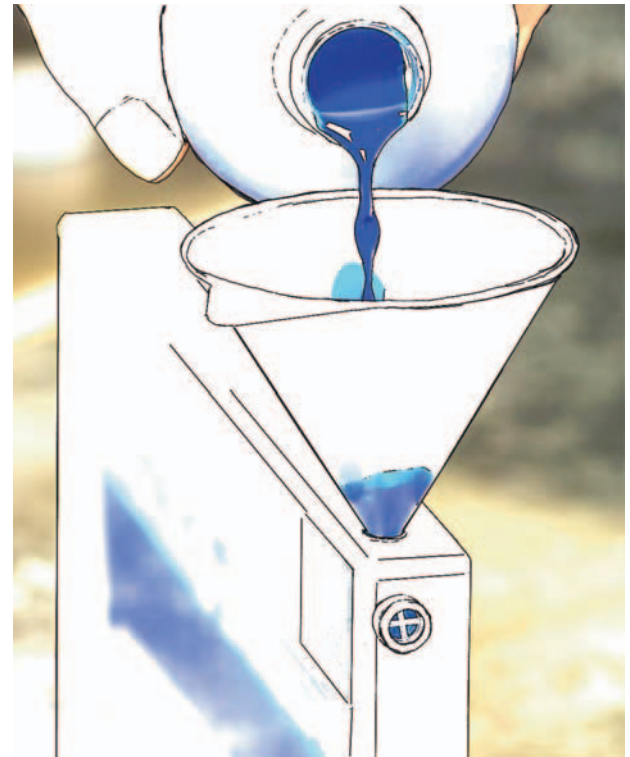
An active studio can go through quite a few sets of ink cartridges a year. Many cartridge brands cannot be recycled. It's a huge waste of our precious resources.

Bulk Ink

There have been a few schemes to regularly pump fresh ink into a printer. Some of them are messy. Most of them require you to



Left: Filling the bulk storage cartridge of a wide-format printer is very easy. Start by opening the cartridge's top port by carefully removing the bung.



Right: Next, insert the provided funnel and just slowly pour the proper ink into it.

remove part of the printer's cover and run unsightly tubes from one place to another.

We prefer refillable cartridges. The savings are tremendous. The ink is excellent. We refill

as we need to. We always have a bottle of each affordable ink on hand.

It's Easy!

We've been using Lyson inks since 2000. When refillable cartridges became available to us, we jumped on it.

Nozzle Check

Printer nozzles can clog. Before you do anything, check to be sure that your printer is working. This is a test that can be done either from the printer's panel or through a special utility on your computer. Make a habit of doing this from time to time. Write today's date on the nozzle check and file it away with the printer's manuals; that way you have a record of when things were working correctly.

It's best to service your printers now, rather than when you're in a panic to get some prints out the door.

Fill a portion of a syringe with 5 milliliters of ink from the bottle.

Filling the Cartridges

The ink2image kit from Lyson's North American distributor comes with everything that you need. It's designed specifically for your make and model of high-end printer.

For refilling the smaller cartridges, use the provided syringe to draw 5 milliliters of ink from the bottle.

If you have a wide-format printer and are using the bulk cartridges, you have it easy. Just pull out the bung, insert a funnel into the opening and pour in the ink. Then reset the chip as we discuss on page 477

Find the cartridge that matches the ink color. On the replacement cartridge is a vent hole and another hole for refilling. Open both of them and just plunge the syringe into the refilling hole. Release the syringe plunger and ink is slowly sucked into the cartridge. Don't push down on the plunger to force the ink into it. Let the suction do its magic. Keep at it 5 milliliters at a time, until the cartridge is full.

It's best to let the cartridge sit overnight, before using it. This step ensures that any air bubbles are out.

Clean up your tools very well with water.

Refill the cartridges only when the printer signals that the ink is getting low. As you have probably discovered, when the printer tells you that it's low, the ink isn't out yet.



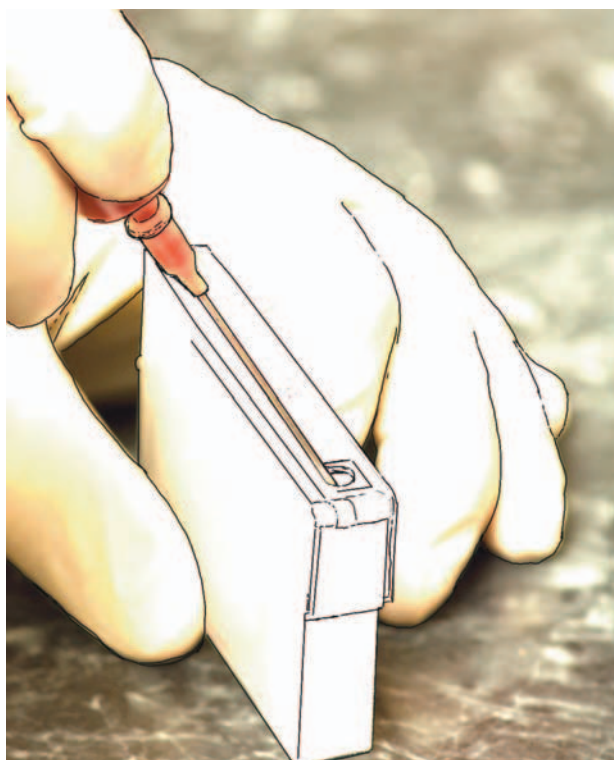
It's like the "low fuel" light on your car's dashboard. There are probably another two or three gallons left in the tank when it goes on.

How It Works

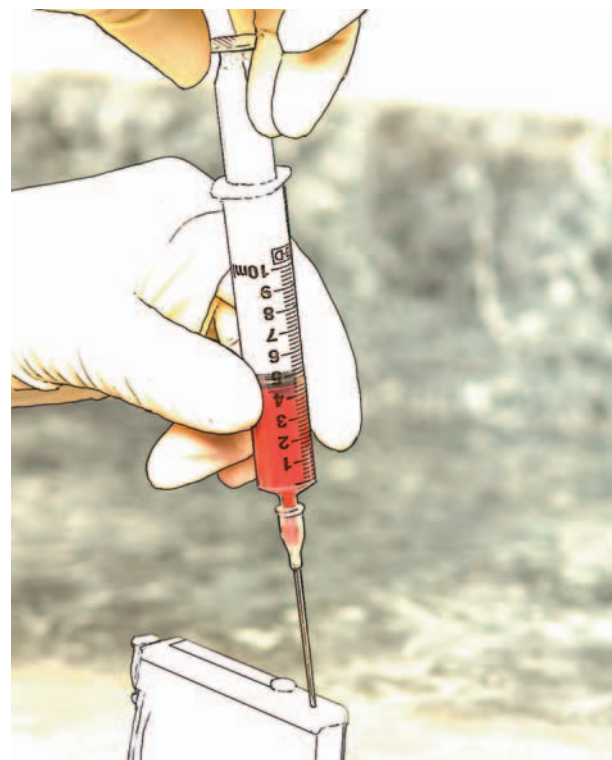
We are very much "What makes this tick?" kind of people. The backs of the cartridges

have little chips on them so that they can communicate to the printer.

You're not supposed to touch them.



Left: Place the syringe as far into the cartridge as it will go. That action forces out some of the air in the cartridge.



Right: Don't force the ink with the plunger. Draw it up and the ink will do its magic, naturally flowing from the syringe to the cartridge

If you're as curious to what the chips are all about, as we were, here's the story.

They're fitted to the refillable cartridges to work with the ink level monitor in the printer's driver software. Just like the cartridges from the printer's manufacturer, the ink monitor shows the ink level in each refilled cartridge, and it changes as you print.

It is very important that you refill a cartridge when the ink level says that it's low.

If you wait until it's empty, the printer will stop printing when the ink monitor software shows the cartridge is empty.

Resetting the Chip

Here's the coolest little printer device for anyone who is into using bulk inks.

Once an ink cartridge for a wide-format printer has been used, the chip will continue to signal the printer that it's completely spent. That would seem to prevent you from recharging it with fresh ink.

You can tell the chip to change its tune. You're in charge of your ink's recharge. A little device from ink2image (right) lets you reset the chip. Touching the pins of the resetting device to the chip for a few seconds causes the little device's flashing red LED to change to

a constant green. Now follow the same directions that we gave you for using the syringe to refill the spent cartridge, just as you did the bulk feed cartridges.

When you reinsert the recharged cartridge into the printer, it will communicate that

it's a new cartridge (which as far as the ink is concerned is true).

This lets our studio "go green" with cyan, magenta, yellow, black, and the other four inks, too. 🌸



The Black and White Gamut

Do you want to print some awesome black and white prints?

Do you like the look of cool-tone or sepia-tone black and white?

Do you have an old six-ink printer sitting around that's feeling a bit unloved?

Then here's something that you're going to enjoy. (You can thank us later.)

Six Ink Black and White

Lyson's Quad Black Toneable Inks is another cartridge refill system. You can use it with your existing wide-format printer, but then you have to purge the existing ink. Install the Quad Black and purge the system again to get it back to being a color printer. It's best to just dedicate a printer to black and white.

Preparing Your Computer

The system comes with a special profile. Install it on your computer as we discussed in the "Where Are My Profiles?" on page 471.

Optimizing the Image in Photoshop

Getting the image ready in Photoshop is going to look a little weird on-screen, but when it prints, all will be fine.

Open a black and white image in Photoshop. Make sure that it is monochrome by using the

info panel. If the RGB values throughout your image are equal, then it's monochrome.

Creating a Warm Image

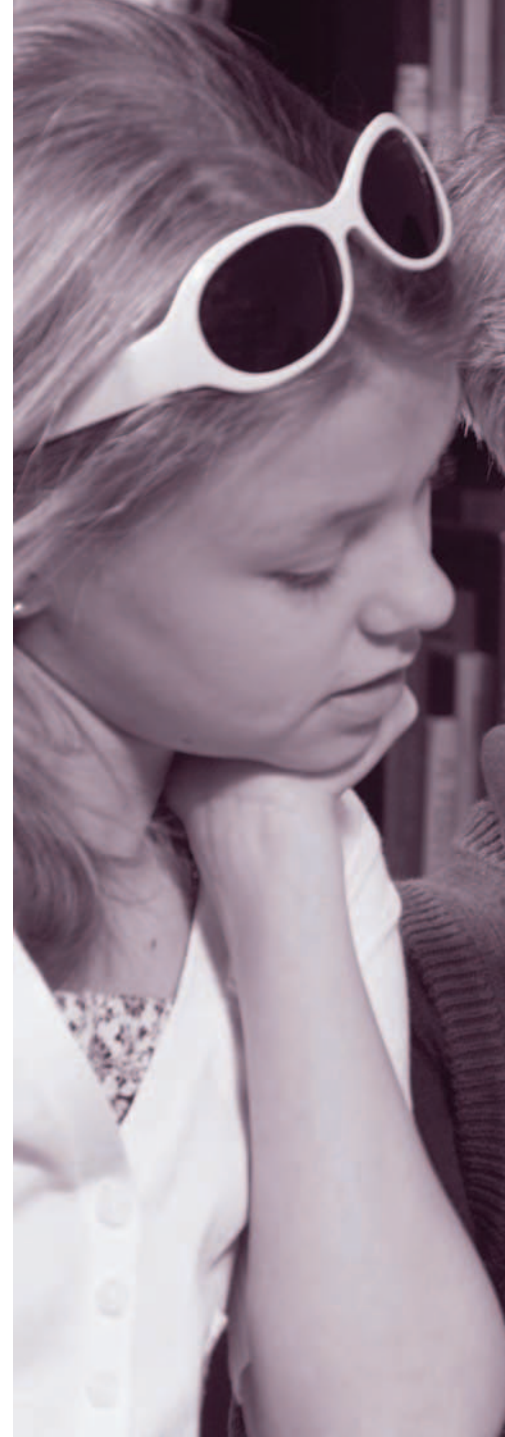
Start by creating a Channel Mixer. Go to Layer > New Adjustment Layer > Channel Mixer. Name it "Warm Adjustment."

Next, on your Adjustment Layer Panel, choose "Load." The Lyson Quad Black Toneable kit that had the profile that you loaded has two .cha files. Select "WarmAdj."

When you did that, your photo should have gone wildly magenta. That's what it's supposed to do. Click "OK" to accept these channel mixer values.

Now the adjustment layer is in your Layer panel. On your Layer panel, there's a drop-down menu that usually says "Normal." Choose "Color" instead. This change ensures that the gray levels of your image are preserved during the application of the color adjustment. It is necessary that you add this vibrant magenta tint to your image. The Lyson color cast activates the magenta side of the printing channels, producing a warm tone on the print. The monitor profile that you have installed filters out much of the vibrancy of this color cast and changes its hue, making it appear like the traditional warm or sepia tones.

Try the same with a cool tone image. ❁





Matte and Gloss

The media selection at ink2image is exceptional. They buy from fine art paper mills all over the world.

Each paper reacts differently to ink.

Premium presentation matte has a brighter white surface than most matte papers, with a wide color gamut. It's an economical photo printing paper and in single- or doubled-sided.

Fiber-based matte is acid-free and great for long-term displays. It's a heavyweight

fiber-based paper with a creamy white smooth finish.

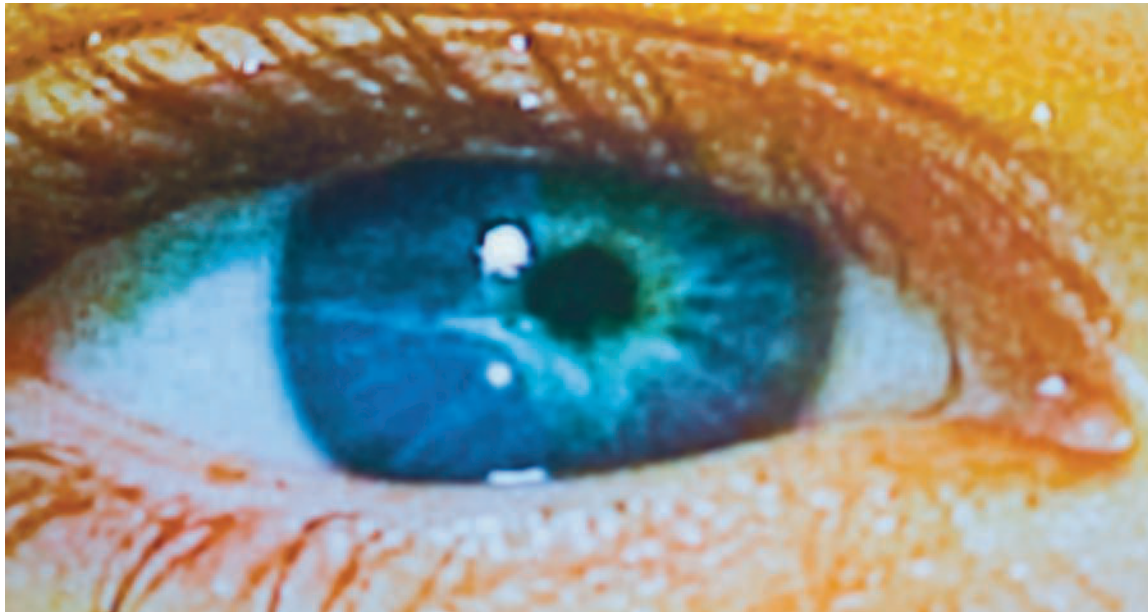
Premium luster and gloss have a bright white background for deeper and brighter color and rich neutral blacks. The photo of the print below typifies its rich, deep colors.

Silver gloss in white and natural looks and feels like the traditional photographic silver type gloss paper. It's an acid-free fiber-based paper in bright white and natural white.

Silver satin is similar to the silver gloss, but with a lower gloss finish.

Smooth fine art is acid-free with an alpha cellulose base with the natural warm color of a traditional watercolor paper that is smooth, but with a little more texture than photo velvet papers.

Protect prints with a UV- and water-resistant lacquer, like Print Guard, below. ☀



Velvet and Canvas

Photo velvet fine art comes in white and natural. Made from 100% cotton and acid-free, its smooth matte surface reproduces the finest details and vivid colors.

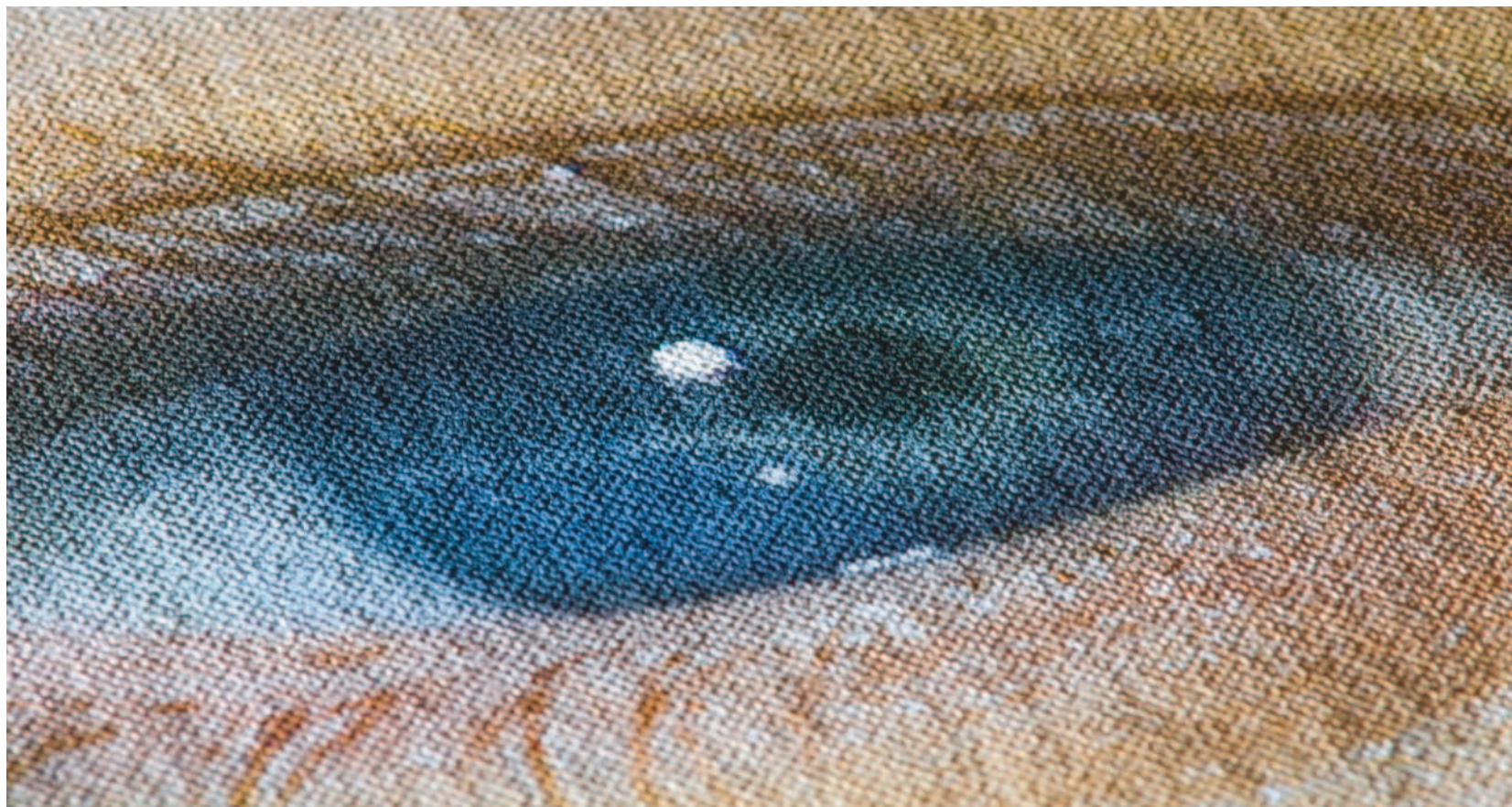
Matte canvas is 100% cotton, 22 mil natural white canvas with a water-resistant coating that is ideal for the reproduction of

fine art and photographic images. Making use of a 2:1 weave for superior strength, it's crack-resistant when stretched. Below is a sense of its texture and richness of color.

Smooth matte canvas has a tighter weave than a normal matte canvas and a bright white finish. It's suitable for the reproduc-

tion of oil paintings and photographic images where too much tooth can detract from the image. It's a 100% cotton, 19 mil base, also with a 2:1 weave.

High-gloss canvas is a super-high-gloss, water-resistant finish made from a 19 mil poly/cotton-blend base. 🌸



Light and Print Longevity

When a photographer sells a printed image to someone, the longevity of that image has to be of utmost importance to them. This is especially true for photographers who cover the special events in personal lives.

The photographer retains the original files and the consumer gets the prints. They may be handed down through the family for generations to come.

The same is true for fine art photographers. They sell exhibit prints sought after by collectors who are willing to spend a pretty penny for something of investment quality.

Silver-Halide Prints, Historically

For years, people preserved memories in black and white photographs. They lasted for decades with no apparent issues of fading.

In the late 1950s, when the color photograph entered the marketplace with great fanfare, people had no reason to believe that the images had a limited lifespan.

These dye-based photographic delivery systems proved how little permanence they had in the 1970s and 1980s, when many of these precious memories didn't just fade, some of them just about completely disappeared.

To this day, if a silver-halide paper print under glass is exposed to 450 lux cool white fluorescent light for twelve hours per day, it has

a twenty- to forty-year lifespan. If these same photos were kept in total darkness in a temperature- and humidity-controlled environment, their lives would be in the range of fifty to one hundred years.

Ink Jet Prints, Going Forward

An ink jet print is created by tiny ink droplets being deposited on paper. The droplets are measured in picoliters, which is a trillionth of a liter.

The longevity of these prints are dependant upon the archival quality of the ink and its receiver, the media, before light exposure is even considered.

Dye-Based Inks vs. Pigment-Based Inks

Inks that are dye-based have many of the same issues as dye-based color photo papers. They offered no solution to the problem. Initially, ink jet printers used dye-based inks, because at the time, they offered the wider color gamut that consumers and professionals desired from the newly emerging digital environment.

Much like color photography in the late 1950s it was something people wanted to embrace, even with all its warts and blemishes.

Today, pigment-based inks are widely accepted and the tolerance for less than technically acceptable image-making has a lower threshold than ever.

An ink set where the pigment particle is encapsulated with resin provides the widest gamut and greatest longevity for lightfastness.

Swellable Papers

Some papers may look pretty but fail to provide the demanded longevity.

Swellable papers, as the name implies, expand with contact by moisture. They have an extended dry time. The paper base is sandwiched between two polyethylene layers, much like the resin-coated (RC) papers of the silver halide days.

These papers are great for dye-based inks, but pigment-based inks are unable to fully penetrate the polyethylene layers.

Porous Papers

This media has a high resistance to moisture and humidity. It dries fast, so there is little concern about smudging. Unfortunately, because these papers have no protective coating, they are under attack in some environmental situations. It's not the kind of stuff for long-life prints near a home's cooking spaces, but what prints are?

Cotton Rag Paper

A 100% cotton rag matte coated paper has excellent longevity, especially if it is acid-free.

Humidity more adversely affects traditional silver halide images than ink jet prints.

Environmental Challenges

No matter how hard the studio lovingly handles its longest life print product to the end user, once it walks out the door, the consumer bears responsibility for the image's care.

There are five key factors that work against the life of the image.

Light

Though great improvements have been made to the longevity of silver-halide prints, light is still their number one enemy of fading.

It is not true that ink jet prints are safe from light fading. They are just not as adversely affected. The paper used has the most significant effect on the fade rate. Tests have revealed that the greatest "lightfastness" is found in pigment-based inks printed on archival papers that they are designed to react with optimally.

Studios need to be aware of manufacturer's claims of lightfastness. Their specifications have to be relative to precise ink and paper combinations. A photographer cannot assume that because a specific printer offers longevity of at least a hundred years that the same is true of all papers that can be run

through it. This can be true of papers from the printer's manufacturer, not just other vendors, as some would like you to believe.

These are responsibilities that studios need to understand for their own best interests and those of their customers.

Not everyone uses the same test conditions.

In a widely accepted white paper report published in 2005, testing prints under 450 lux illumination revealed that some dye-sublimation prints lasted only four to eight years, whereas some pigment-based ink jet prints on compatible paper provided as much as 115 years of longevity.

Even some consumer-oriented pigment-based products exceeded one hundred years. However, other papers that claimed a century of longevity made it for only eleven years with some dye-based ink jet printers.

A well-known brand of silver halide photo paper in a popular mini-lab environment, lasted only nineteen years in the same testing.

Dark Keeping

It is true that some materials that last only ten to twenty years under prolonged exposure to light can survive hundreds of years in controlled dark storage. It cannot be assumed that dark keeping will preserve longevity with all print materials.

Temperature and Humidity

Prolonged exposure to high humidity can cause fungal growth on all prints. High heat and humidity adversely affect traditional silver halide prints more than ink jet prints. Though pigment-based inks are the least affected, dye-based ink prints on swellable paper lose image quality.

Gaseous Pollutants

Ink jet prints with pigment-based inks are not as susceptible to ozone pollutants as are those with dye-based inks. Framed prints behind glass stand a better chance of survival.

Water

A traditional silver halide print has a better chance of being restored from water damage than one from an ink jet printer. Ink jet prints can be ruined by water, if they're not on a water-resistant medium.

Further Research

This is not the final word on print longevity. Some manufacturers are staking their reputations on it, so we hope for more progress.

Take it upon yourself to stay on top of this.

An excellent resource for learning more is Wilhelm Imaging Research. Please visit them at wilhelm-research.com. 🌿

Appendix and Product Index

Adobe

adobe.com

Adobe Systems, Inc
345 Park Avenue
San Jose CA 95110 USA
Voice..... 408.536.6000
Customer Service ... 800.833.6687
Technical Support... 800.642.3623

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Voice..... 631.547.4200

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Colophon

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